FARMERS DIGEST

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THE FARMER'S DIGEST

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Publisher — Hugh Highsmith
Office Manager — V. M. Binkert

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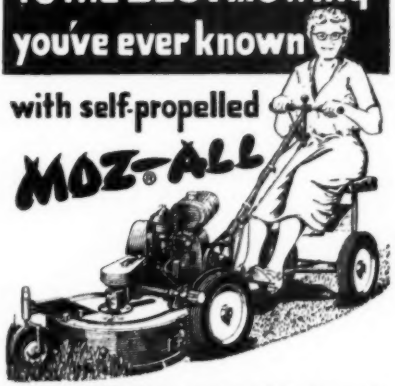

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The **Farmer's Digest**

Volume 19 April 1956 Number 10

Report on a Popular New Practice —

HAULING PASTURE TO COWS

Tests show you can get more feed per acre and maintain milk production during summer months by chopping and hauling pasture to your cows . . .

Condensed from The Furrow

CALLED by many different names—soiling, zero-grazing, or green feeding—the old practice of clipping pastures and hauling the fresh forage to confined cattle is making a strong comeback. Many farmers are trying it, many more are watching the results with a great deal of interest.

K. E. Gardner, University of Illinois dairyman, says that soiling is not new—it's probably centuries old. It was once popular on early American farms where there was an abundance of help. Soiling faded out as labor costs went up. Now, labor-saving equipment, such as field choppers and self-feeding wagons, are largely responsible for its return.

Efficient Use of Pasture

The chief advantage of soiling is that it enables a farmer to make efficient use of his pasture. He can increase beef gains, step up milk production, and reduce feeding costs by chopping legume-grass pastures and hauling the fresh forage to his livestock.

Cattle waste pasture. They tramp some down and their droppings spoil more. Furthermore, unless carefully managed, cattle can destroy pasture by over-grazing or let it grow rank and unpalatable by under-grazing.

Soiling eliminates most of these problems, but there's no getting

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around it, soiling requires additional work and the burden is placed on the farmer's shoulders. He must furnish his cattle with the amount of fresh forage they require and do it daily.

Protection Against Bloat

Four Grundy county, Iowa farmers—Clarence Bockes, Gordon Peters, Dwight and Lyle Heltibridle—found that soiling is good "bloat insurance." Each, after having an animal bloat and die while on pasture, switched to feeding freshly chopped forage for the extra protection it gives against bloat. They now have good control over each animal's forage consumption.

More Milk Per Acre

According to G. A. Williams, Purdue University dairyman, zero-grazing offers many dairy farmers a good opportunity to take the ups and downs out of their milk production and cut feed costs at the same time. Williams referred to the records of one DHIA cooperator of Miami county, Indiana, to prove his point. By feeding soilage, this farmer produced 11,515 pounds of milk per acre of forage. The feed supply was cut in the evening and replenished daily. Time required going to the field, operating the field chopper, returning to the feed lots, and unloading the grass amounted to about an hour per day. The forage was cut in the evening to reduce heating as much as possible. More than 100 days of zero-grazing amounted to a total of 103,575 pounds of milk at a total feed cost of $1,018.

Increased Beef Gains

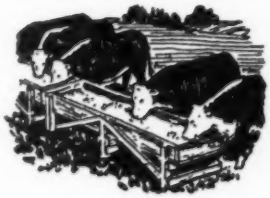
In 2 years of tests with beef cattle, conducted by Iowa State College on the Western Iowa Experimental Farm near Castana, pasture clippings fed to fattening cattle in dry lot produced an average of 545 pounds of beef per acre in each of the 2 years.

A better chicken, eating better feed and getting better care is far outstripping her ancestors of 25 years ago. The rate of lay per hen last year was 184 eggs compared to only 121 eggs in 1930. The nation's laying flock in 1954 was only 10% larger than in 1930, but total egg production was up 67%.

Cattle of similar weight grazing comparable alfalfa-brome pasture gained an average of only 195 pounds of beef per acre. Dr. Wise Burroughs, beef cattle nutritionist of Iowa State College, says hauling the clippings to the cattle resulted in about 2¾ times as much beef per acre. The cattle in these tests received block salt but none of them received any grain or supplement.

PERFORMANCE TESTING

New Tool for the Beef Business



Will scales replace the show ring in judging beef cattle? Here's a report on the program in Virginia . . .

Condensed from The Breeder-Stockman

Thomas J. Marlowe, Virginia Polytechnic Institute

ALTHOUGH performance testing of beef cattle to determine the more efficient strains was used by the men who first developed and improved our present-day breeds, it was later almost entirely abandoned in favor of show-ring standards in which beef type became the only important characteristic of selection.

Consequently, very little progress has been made in recent years in rapid gaining ability and feed efficiency. Such testing was replaced by the beliefs that men could see in an animal the efficient producer. Many recent experiments, however, have shown that man is not able to look at a group of calves and pick out those which are fast and economical gainers.

Performance testing is based on a few simple facts: (1) Individual animals differ in their ability to grow and put on finish; (2) Characteristics of economic importance such as rate of gain, feed conversion, and carcass quality are inherited; (3) Production testing is a research and breeder-proven method of improving beef cattle; and (4) Performance testing automatically provides data for progeny tests of the sires and a record of the reproductive performance of each cow.

The Virginia Aberdeen-Angus Association, on the basis of experimental results at the Virginia station and at other stations, thought a program of performance testing on the farm of the breeder was possible. This association, in cooperation with the experiment station and extension service of the Virginia Polytech-

Reprinted by permission from The Breeder-Stockman, Warrenton, Virginia

nic Institute, started a program in January, 1953.

Nine Angus breeders were selected to participate in the initial phases of this work. One of the first problems to overcome was the matter of scales on which to weigh these animals since many of the small breeders in the state do not own a set of livestock scales. This problem was solved when Dr. C. M. Kincaid obtained the services of the Virginia State Highway Department in building a portable scale. This scale was constructed on a two-wheel trailer which could be pulled from farm to farm and set up for operation in about 15 or 20 minutes. Each farm was visited twice and the weights, a type score, and certain body measurements were obtained for each calf when the calves were between four and eight months of age. An index was computed for each calf based on growth rate and type score.

These data were summarized by sire, age of dam, and sex of the calves and furnished to each cooperating breeder. It was concluded that a practical, useful program for the improvement of beef cattle could be achieved.

Interest in this program on the part of beef cattle breeders was such that the Legislature appropriated funds to employ a man in 1954 to direct the program and make it more widely available to the beef cattle industry. During 1954, 26 Virginia beef cattle breeders used this new tool. Approximately 1,100 calves and 300 yearling cattle were enrolled in the program and an index value obtained for each. This information was sent to the breeder for his use in selecting his herd replacements. In March, there were about 70 herds enrolled.

Since available research information indicates that desirable beef type and growth rate should have equal emphasis, it was felt that a state grader with considerable experience in handling purebred livestock as well as in grading commercial cattle should be made available to assist personnel of the Experiment Station and Extension Service in the grading of these calves. Joe Graham, a V. P. I. graduate in animal husbandry with considerable experience as manager of purebred herds, was employed by the state grading service to do the grading.

In order to give equal weight to growth rate and to type and conformation of each animal, it was necessary to have an index. The index was meant to give an average calf an index value of approximately 100. In making the index, several factors had to be considered. It is common knowledge that bull calves grow

faster than steer calves and steers grow faster than heifers; therefore, some adjustment needed to be made in order that a direct comparison of progeny sires could be made.

Data collected on several hundred calves owned by the Virginia Agricultural Experiment Station was used in arriving at these adjustment factors. Growth rate of steer calves was used as the base and bull calves were adjusted downward by three per cent; whereas heifer calves were adjusted upward by five per cent of their average daily gain from birth to weaning. It is also known that calves from first calf heifers are lighter at weaning than those from older cows. To correct for this difference, eight per cent was added to the actual growth rate of the first calves. These adjustments may need further refinement as information is accumulated, but up to now the objective has been to make allowances for known factors that have an important influence on growth up to weaning.

The dairy industry is pulling itself away from government subsidy programs. More milk, more butter and more ice cream were consumed in 1955 than any previous year. Although dairy production rose slightly last year, government purchases of surplus dairy products dropped almost 50 per cent below 1954 levels.

A standard grading guide has been developed for this program using grade designations of fancy, choice, good, and medium. The numerical value assigned to each grade was adopted for Southern Regional Beef Cattle Breeding Program several years ago. The grade of fancy was given a value of 16, choice a value of 13, good a value of 10, and medium or commercial a value of seven.

The index for grade is obtained by multiplying the numerical value of the grade for each calf by 5. The index for weight is obtained by multiplying the adjusted gain per day of age by 40 and subtracting 18. For example, a calf grading good (10) with an adjusted gain of 1.7 pounds per day from birth would have an index of: (10x5) plus (40x1.7 minus 18) equals 50 plus 50 equals 100.

Any breeder desiring to enroll his herd in this program may contact his county agent or write the animal husbandry department at V. P. I. and request enrollment. He is sent a letter of instructions on the use of IBM cards for recording such information as the number of each calf, the date of calving, birth weight, the sire and dam, and

breeder's name. Each farm is visited once or twice per year for the purpose of weighing and grading his calves. From these data, an index value is computed for each calf. A summary of the information on each calf weighed and graded is sent to the breeder. This information will enable him to see immediately which bull is doing the best job for him and which cows are producing the heaviest and best quality calves at weaning.

One good example is a farm in which three bulls were used to sire the 1954 calf crop. Considering all of the calves sired by each bull, it was found that bull A's calves averaged 1.45 pounds per day from birth to weaning and had an average grade of good plus, giving an index of 93. Bull B's calves averaged 2.0 pounds per day, a grade of choice plus, giving an index of 131. Bull C's calves averaged 2.57 pounds per day, a grade of choice plus, giving an index of 154.

All of this information is punched into the IBM card for each calf and kept as a permanent record. From such information, it is easy to compute the lifetime performance of any cow at any given time. This will provide the breeder with valuable information for his use in culling out his low producing cows. It will also point out his high producers and enable him to select his herd replacements from these high producing cows.

To obtain the most value from a performance testing program, one should follow the steps below:

(1) Obtain an index on each calf at weaning time.
(2) Save twice the number of replacements needed from the heifer calves having the highest index and as many bulls as show promise of becoming herd sires.

Increased use of molasses in animal feeding, under way since 1949, continued in 1954 and 1955. The total quantity of molasses fed in calendar year 1955 reached a new high of 428 million gallons, about double the quantity fed five or six years ago. Large supplies at relatively favorable prices are responsible for this trend.

(3) Place the bulls on a standard full feeding trial for five or six months and obtain a new index value at the end of this period.
(4) Do the same for the heifers or carry the heifers through the winter on a suitable growing ration and test on grass during the following season.

(5) Select those animals having the highest index to be saved for herd replacements, saving more than actually required.

(6) Make a pregnancy check at the end of the grazing season after breeding and eliminate: (a) all of the heifers which are not in calf, (b) all cows from the bottom end of the herd that are not in calf, and (c) as many other low producing cows as you have good heifers to replace them with.

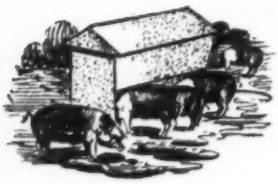
It should be pointed out that the performance of the calves up to weaning is a good measure of the milking and mothering ability of the cows. It also provides a comparison of the ability of the different bulls to transmit to their off-spring rapid growth potential and desirable type. It is not a good measure of the growth potential of the individual calf, however, since this trait is determined to a large extent by the amount of milk that the cow produces. Until research clarifies the use that can be made of weaning weight in evaluating the growth potential of the calf, performance tests such as (3) or (4) above should be relied upon for selecting high performing individuals.

Creep feeding of all calves would tend to eliminate some of the differences due to the differences in milking ability of the cows and give a better estimate of the growth potential of each calf. A much more accurate method of measuring the gaining ability of each calf, however, is to put all calves on a standard ration (full feeding) for a period of five or six months and determine their rate of growth during this period.

Band spraying, like band spreading of fertilizer and seed, may become a necessity. New, specific weedicides are too expensive to be sprayed broadcast. Band spraying greatly lowers the cost of treatment.

Since this is rather expensive and not practical for many beef cattle producers, another alternative is to weigh the animals at the beginning of the grazing season and measure their growth rate during the summer grazing period as yearlings. Animals to be tested by either of these procedures should be selected from among the highest producing cows and from the outstanding sires, based on their performance up to weaning. Enough animals should be carried over for the test period so that only the outstanding ones of this group would be kept as replacements for the breeding herd.

A Planned Hog Program Pays



Equipment, management, nutrition and marketing have been important to this alert west coast farmer . . .

Condensed from Electricity On The Farm

Herbert Jonas

FARROW sows in January and June—put electricity to work to save on costs and to help hurry along gains—have pigs ready for market when pork supplies are light and prices are up.

These are the basic rules F. P. Rodman follows to make extra dollars from the 1,000 head of hogs he sells each year from his Yakima Valley farm enterprise. Following this basic rule over a period of 15 years has enabled Rodman to expand his farm holdings from a small 10-acre place of ownership to a 78-acre diversified farm and a 27-acre fruit orchard.

"We farrow early and feed heavily, figure on getting 200 pound hogs in 5½ months. This puts our January pigs on the June and July market, and puts our June pigs on the January and February market—just before and just after the heavy influx of fall marketed pigs," says Rodman.

Here are ways this successful Yakima Valley farmer puts electricity to work to get bigger returns from hog raising:

- He used infrared lamps to avoid cold weather farrowing losses and give young pigs a better start.
- He uses electric lights in hog houses and feed lots to keep animals active and feeding day and night.
- He puts electric water warmers in stock tanks during winter months—boosts gains by 10% during this period by inducing hogs to increase their cold weather intake and eat more feed.
- He uses sprinkler irrigated pastures to reduce grain requirements for hogs during the grazing season—also uses these pastures to hold hogs at market weight while awaiting a favorable price development.
- He has water piped under pressure from a 40 ft. well by a ¾-hp. electric pump to the farrowing house, feed lots, hog

Reprinted by permission from Electricity On The Farm, New York City, N. Y.

houses and pastures. He also has his own grain grinding and conveying system which he uses with an auger feed cart to supply self-feeders in the hog yards. He says these uses of electricity, alone do the work of an extra hired man.

The Rodman farm has a 128 ft. by 30 ft. farrowing house which contains 32 farrowing pens. Each pen is outfitted with a heat lamp brooder for winter use and a farrowing crate for summer use. This arrangement helps reduce baby pig mortality to about 1%.

"Our baby pigs start on protein pellets when they're three days to a week old," Rodman points out. "We figure they'll make one pound of gain for each 1½ pounds of pellets we feed, will weigh 45 pounds and be ready to wean at six weeks.

"Feeding these protein supplement pellets helps eliminate scours, guards against runts, and brings a good return on the price of the pellets. At 1955 prices, when pellets were $160 a ton and hogs were worth $18 a hundredweight, we got 12c worth of gain for every 8c worth of pellets we fed."

Rodman continues to pour feed to his animals after weaning. Hog houses and yards are lighted at night to keep growing pigs active and eating. Shoats start on a ration of 1500 pounds of barley and 500 pounds of protein supplement. At 60 pounds weight, the animals get 1600 pounds of barley and 400 pounds of supplement. When the pigs reach 125 pounds weight, the ration is adjusted to 1700 pounds of barley with 300 pounds of supplement. This feeding schedule is aimed at bringing hogs up to 200 pounds market weight at 5½ months.

Rodman feeds heavily, but he economizes wherever he can on grain expense. He puts great stress on irrigated pasture. And, he shops around at harvest time to save $5 to $8 per ton on the 150 tons of barley he stores in his granery. He makes further savings by grinding and mixing feed on the farm.

After studying and experimenting with pasture mixtures for several years, Rodman has concluded that best results are obtained with straight alfalfa pasture. He cross-fences pastures with electric fencing for easy rotation. He relies on electric pumping and sprinkler irrigation to get quick recovery of pasture plants after grazing.

"Pasture management is important to making money out of hogs," stresses Rodman. "We cut our grain bill 20% by pasturing during grazing season, and we can hold hogs at market weight on pasture two to four weeks

while awaiting a favorable price."

Here are more of Rodman's recommendations:

Choose good stock. Only healthy sows have healthy, strong pigs that grow into top price hogs.

Strive for big litters. Mating is important. If a sow is mated a day early or a day late, she will have fewer pigs.

Keep hogs clean. Rodman uses an electric sprayer to spray for flies once each 21 days during fly season. He keeps pens so clean, there is no odor and no need for vaccinating.

Keep hogs cool. Rodman has aluminum roofs to reflect heat from his buildings. He has garden hoses from pressure water system connections to afford overhead sprinklers for hogs during hot weather.

"Take care of your hogs, farrow sows early, get hogs up to market weight as soon as you can, get them sold, and get the money in the bank," counsels this successful hog raiser.

Data on Diesel Engines

Water, dirt, and sulfur are the greatest detriments to the satisfactory performance of diesel engines, C. L. Hill, agricultural engineer at Purdue University, has advised farmers.

Hill says water is more of a problem in diesel fuel than in gasoline since its weight is about the same as the fuel. Most farmers set their tanks at a slant which will lead the "settled out" water to drain. Water has no lubricating qualities and when droplets are pumped into the diesel fuel injectors, moving parts rub together and scratch or gall the machined surfaces.

Sulfur is important because it affects the fuel injection system and the type of crankcase oil used. A high sulfur content may leave deposits which make injector parts inoperative. However, sulfur content is not the only factor which the buyer of diesel fuel should know. The engine manufacturer also specifies such important qualities as viscosity—which indicates how well the fuel will lubricate injector parts. ash content, and pour point.

Hill warns diesel operators that the matching of satisfactory oil with a particular fuel is of paramount importance. Manufacturers and oil companies have listed by brand or company name, the combination of engine, fuel content and type of oil which gives satisfactory operation in the various makes of diesel engines.

Indiana Extension

Milk Produced per Acre, That's What Counts

High quality hay and silage—harvested right and stored right—can mean 20% more milk . . .

Condensed from Successful Farming

George Trimberger and *William Ward,* Cornell University

DAIRYMAN Ralph Space and son, Ronald, produced 2,083 pounds of milk per acre in 1954. How did they do it? By putting more emphasis on milk production per acre.

Ralph and his son own and operate a 160-acre dairy farm near Dryden, New York. They carefully watch and emphasize the milk production per cow, per man, and per acre.

In 1954, their 40 purebred Holsteins produced 467,800 pounds of milk, or an average 11,695 pounds per cow. Milk production on a per man basis averages between 150,000 and 200,000 pounds per year. *But the figure that tells the real story of profit or loss is the 2,083 pounds per acre.*

Look at the changes that have taken place on the Space farm during the past few years. The only thing that hasn't changed is the total acreage! While other farms were increasing total acreage, the Spaces were increasing their production by using improved methods and stressing top-quality forage production. After all, it's the net income, not the gross volume, that keeps you in business.

The major portion of the grain was purchased. After calculated milk production from grain was deducted, 193,698 pounds of milk were produced on 93 acres used for pasture and roughage production for the milking cows.

Last year was an even better one for the herd. The latest report showed it producing over 40,000 pounds per month, or about 5,000 pounds more than 1954.

Ralph and his son spend 4 to 5 minutes milking each cow. They operate only 2 machines so they can give more attention to proper individual milking.

Reprinted by permission from Successful Farming, Des Moines, Iowa

This is important to get the best use out of good roughage and other feeds.

On some land they have brome, alfalfa, and Ladino—their first choice for land suited to this mixture. The other pasture-hay land had Ladino and timothy seeded on it. Their 50-foot silo is filled each year with a high-quality hay crop to feed out in late summer when pasture gets short. In the fall, this silo is filled again with corn silage.

This all-year-around program, combined with good pasture, set the stage for high milk production per acre.

The Spaces work only a normal day, leaving time for social activities and participation in farm and civic organizations. Moreover, when you visit their attractive farm home with all of its modern conveniences, you can at once realize the advantages of a program emphasizing milk production per cow, per man and per acre.

SIZE OF BUSINESS	1937	1954
Size of farm (acres)	160	160
Crop acres	61	87
Cows in milk (number)	11	40
Yearling heifers (number)	9	22
Calves (number)	7	13
Number of laying hens	770	1,200
Man-equivalent	1.3	2.4
CROP YIELDS		
Hay production (tons)	52	116
Hay per acre (tons)	2.0	2.8
Corn for silage (tons)	90	225
Silage per acre (tons)	10	12.5
Grass silage (acres)	none	14
Oats (bushels)	375	1,600
Oats per acre (bushels)	30	80
RATE OF PRODUCTION		
Total milk production (pounds)	96,734	467,800
Total butterfat production (pounds)	3,289	18,240
Average milk per cow (pounds)	8,794	11,695
Average test (per cent)	3.4	3.9
Average butterfat per cow (pounds)	299	456
LABOR EFFICIENCY		
Cows per man	8.5	16.6
Milk per man per year (pounds)	74,406	194,917
Milk per acre (pounds) (From pasture and roughage only)	892	2,083

How To Ease Thru the Squeeze

Now is the time to cut costs and to do some close figuring . . .

Condensed from Breeder's Gazette

J. W. Burch,
Director of Missouri Extension Service

AS WE look ahead through 1956, we don't see much that promises immediate relief from the price-cost squeeze. But price times volume equals gross income, and gross income minus cost equals net income, still.

Stated another way, net farm income rests on a 3-legged stool —the price you can get for your commodities, the volume you have to sell, and your costs. If you are in trouble with any one of these, the stool will tip and may collapse, unless something is done. Since this is a time of surpluses, our first endeavor should be to hold down costs, by really applying Balanced Farming.

Switch to Meat hogs as a start. If you have feed for 75 pigs, you can get them from 10 sows at 7½ pigs per litter, or from 15 sows at 5 pigs per litter. Those 5 extra sows will use the equivalent of 25 bushels of corn each from breeding time until the pigs are weaned. This, at a dollar per bushel, is a cost of $125 for the 5 extra sows, an extra feed cost per pig at weaning time of $1.65. On a 40-lb. pig, this is a handicap of $4 per hundredweight at the outset.

Most farmers now have more work than they can get done. It looks like the right time to push self-feeding silage. This applies both to beef cattle and dairy cows, although it may be questionable in some cases for beef cows. The practice of setting aside a field to grow up in grass to be used during the fall and winter for beef cows would save a lot in the cost of baling hay and then hauling that hay out to the cows during the winter.

With beef cattle, quality of calves becomes more important as the profit margin narrows. In looking over the results of one 1955 feeder calf sale, we see a 400-lb. calf that brought $100. In the same sale another 400-lb. calf brought $55. The farmer who produced that $55 calf would have to incur the expense of keeping two beef cows instead

Reprinted by permission from Breeder's Gazette, Spencer, Indiana

of one to get the same gross; indeed, he would have a much lower net, if any.

With dairy cows, we find that it would take 16 cows out of one of our high D.H.I.A. herds to give a $3,000 labor income. But it would take 100 average milk cows to bring that $3,000 labor income. In the first instance, there was $185 labor return per cow. For the average cows, there was a $29 labor income, if you figured the milk at the same sale price. The facts are that the milk from the average cows brought $3.40 cwt., and that from the D.H.I.A. cows brought $4.40.

Quality pasture, silage and hay will help cut milk cost. To get these will require increased use of fertilizer on many farms, instead of a decrease. However, from the standpoint of surpluses, remember that if a farmer is to have a $3,000 labor income from the 100 average cows, he would sell about 4 times as much milk (4,580 lbs. by 100) as would the man with the 10,000-lb. cows.

If you would cut down $500 on your costs, this would help you on your net income the same as if you added $1,500 to your gross income. This is true because, under present conditions, on the average, 2/3rds of gross income goes for cost of production.

The machinery item looms large in expenses. Are you sure that you have the right size tractor? Do you have a 3-bottom tractor that furnishes the power you need for the short period of breaking ground, and a lot more power than you need for cultivating; mowing and other jobs, for about 80% of the time?

Isn't there some way that could be worked out, so that every farmer would not have to have the expensive machinery necessary for every job on the farm? Would it not be possible for one farmer to own the hay baler and do custom work for his neighbor in baling hay, if the neighbor, in turn, would own the field chopper and agree to do custom work in cutting silage for the first farm?

Is there any way that we can, through the efforts of our agricultural engineering specialists, motivate our machinery dealers into large scale training classes for farmers, that would help them keep their machinery in the condition that would make it last years longer and keep it out of the shop, with accompanying heavy cash outlay?

Many people are making the sweeping statement that this is the time to quit using fertilizer. This, of course, is not the answer. Yet are there not some ways in which we could save money on fertilizer costs? At the outset, if all of the fields were tested, those

requiring the least addition of fertilizer to bring them up to the basic requirements could be selected first. If potassium was the low element, that alone could be added, as long as the other plant food elements were present in sufficient amounts.

In using starter fertilizer for corn, there is no experimental evidence that 100 lbs. would not do just as much good as 200 lbs. There is also no evidence that a 3-12-12 would not do just as well as a 12-12-12.

We can still go a long way in furnishing nitrogen through legumes. We certainly should conserve and use all animal manure; should make sure that livestock is out on the fields just as many days as possible; that ample bedding is used in barns and lots; that the manure is protected from leaching and that when it is spread, it is reinforced with phosphate.

This may be the year to shift some production to crops in lowest supply, such as soybeans. We could increase the practice of hogging-down corn and wheat, to save harvesting costs. We could hold down our row crops to the amount that we can really take care of, and get maximum production per acre. We can watch for and prevent losses from weeds, insects, diseases and carelessness. It is not a good time to switch to new varieties if the seed we already have is practically as good and is available at a lower cost.

The farmer now takes only 40% of the consumer's food dollar. It happens that the farm family is also a consumer. If you raise a good garden this coming year and if you butcher some good 11c hogs, produce your own milk and eggs, and properly conserve the food you produce, you will have a better diet and will save 60c of the consumer's dollar that goes into processing, packaging and retailing. We can reasonably estimate that the farm family can save an additional $100 per year on the family food bill if they will fully utilize their gardening opportunities.

Farm family records show that approximately 1/3rd of gross farm income is spent for family living items. So, plan for family expenditures. Not only in the home production and conservation of food is this important, but also in the use of family labor and skills and leisure time.

Consider alternatives in making necessary purchases. Maybe the standard model will do the job just as well as the deluxe.

Farm management studies in Iowa show that the 240-acre farm, in general, has shown a larger net income than either a smaller or larger operation. This size fully utilized a 1-tractor setup. A smaller size didn't, and

the larger size called for too much additional outlay of machinery and/or the employment of additional labor much less efficient than the operator's own labor. This may come as a shock to those who maintain the family farm will pass out of the picture in favor of the corporation farm. According to the Iowa figures, it just "ain't so."

Every one of us believes in Balanced Farming for Better Living. How can we have better living when net income is low? Farm families can have recreation with very little cost, for which city folks have to put out a lot of money.

There are little things that can mean much in the way of gracious living for farm families in the years ahead. They are not offered as a substitute for parity prices. They constitute a reaching back to hold some of the things of past years to maintain some of the natural advantages that farm living has. These things won't take the place of cash income. But they help some!

Artificial Breeding Brings Big Step-up In Milk Production

Artificial breeding of dairy cattle, only begun in the U. S. in 1938, has brought a big boost in milk production per cow for many dairymen in the past five years, says Delmar Young, Extension Dairyman at the University of Delaware. Results from a sizeable number of Delaware herds where the cows are tested regularly and careful records kept, show that the average artificially-bred cow in such herds is now giving at least 500 pounds more milk than the cow that stood in her place in the milking line 5 years ago.

Not all of this increase in milk production can be credited to artificial breeding, Young hastens to point out. But he says that the use of outstanding production-proved bulls whose service is made available to farmers through the artificial breeding associations has played a big part in improving many herds of grade cattle in particular. Butterfat production per cow also is up about 7½% from five years ago in these artificially bred herds, although the "test", or percentage of butterfat to milk, has stayed about the same.

Nationally, artificially-bred cows owned by members of Dairy Herd Improvement Associations have shown an increase in production averaging about 115 pounds of milk a year in the past five years, Young reports.

How to Get the Most for Your Fertilizer Dollar

Test every field so you will know where fertilizer will give the best returns. Fertilizer will pay well on farms with good, sound, management plans . . .

Condensed from Missouri Ruralist

Cordell Tindall

FARMERS have learned fertilizer is a good investment. In general they receive $3 return for every dollar spent. Fertilizer still is a good investment when prices decline.

To be realistic, tho, we must recognize that many farmers now have less operating capital. Some are pressed for cash to buy needed supplies—for feed, seed, machinery, labor and fertilizer. It may appear fertilizer is the one item that is not absolutely necessary. Let's take a second look at this viewpoint!

If it's necessary to cut costs let's see how fertilizer costs may be reduced—not eliminated. It may be that less fertilizer can be applied on some farms as an emergency measure. Or it may be we can invest our fertilizer dollars in such a way as to realize more returns on our investment.

First, let's review the general system of using fertilizer that has long been advocated by the Missouri Agricultural Extension Service, and the soils department of the Missouri College of Agriculture. For many years they have been suggesting that first the basic fertility needs of the soil be brought up to a high level. This has often meant heavy applications of plant food—much larger applications than we once considered. Then, smaller annual applications can be made to replace plant food removed by cropping or grazing.

This is a long-time program and it is a sound one. The farm operator who has sufficient funds available will find it profitable.

But the only way to beat the "price squeeze" is to cut produc-

Reprinted by permission from Missouri Ruralist, Kansas City, Missouri

tion costs. Actually, continued heavy applications of commercial plant food many times reduces production costs by boosting yields. But is there a practical limit to the immediate returns from heavy applications? Little or no plant food applied is ever wasted but it may take several years to get all the benefits. We all have seen the "residual" results of applications for corn during recent dry years when moisture cut yields. Crops the following year, whether corn or small grains, have reaped the harvest of the fertilizer applied the year before.

How can we get most for our dollars spent for fertilizer? Where can we cut costs a little and still keep up high yields?

John Falloon, Extension soils specialist, has some excellent practical advice.

He points out that fertilizer pays most on farms with a good, sound management plan. Simply spreading fertilizer does not assure anyone he will make money farming.

As the first step in any fertilizer program, Mr. Falloon suggests a complete soil inventory of the farm.

Test every field on your farm urges Mr. Falloon. It may save you money. You may have one field lacking in only one soil nutrient. We'll say its phosphorus. That field may have plenty of nitrogen and potash and calcium. If such is the case, an application of phosphate will give you the most return for the money spent.

The complete soil inventory will let you know exactly where you can best spend your fertilizer money.

And when you are considering use of commercial plant food containing the usual nitrogen, phosphorus and potash, don't overlook the importance of lime or calcium. When you spread fertilizer on a field of medium or low acidity you will get a good response. But if the field is acid, with a Ph of 5.5 or less, you may get little or no response with non-legume crops by using fertilizer.

There's one source of plant food you can use that you don't have to buy. That's manure. Actually, there's no such thing as "average" manure, but in general its chemical composition is comparable to 10-5-10 fertilizer. That's when it is fresh or well preserved. If left out in the open nitrogen and potash may leach out of it.

Moreover, all fertility in manure won't be available for the first crop after applied. See that the fertility available for the first crop corresponds to a 4-2-6 fertilizer. If you apply 10 tons to the acre this would be the same

as applying a 40-20-60 fertilizer.

About half a bag of phosphate on every load of manure will mean a 40-100-60 fertilizer, the equivalent of about 500 pounds of 0-20-10 plus 100 pounds of ammonium nitrate.

In adding phosphate the easiest way is to spread it in barns or stalls. Actually, the phosphate combines with nitrogen in the manure to hold ammonia so it will not be lost so readily. Bedding is needed to hold liquids.

There's another type of fertilizer that may cost less—green manure. Average sweet clover has 100 pounds of nitrogen when plowed under, of which about 40 pounds are available to the first crop.

There was a time when we considered "starter" fertilizers highly important but that was when we were making only light applications of plant foods. Starter fertilizers are those applied at the time of seeding.

Now, as indicated, big basic applications are made to really correct soil fertility deficiencies.

Does the starter application still have a place? This may be a place to "cut corners" with fertilizer on some farms.

Soil tests do not reveal how much fertilizer should be used as a starter—actually starter fertilizer is merely to give the young plant an extra boost. It does not go very far in actually supplying the plant food needs of the mature crop.

Starter fertilizers have little place on poor soils, according to Mr. Falloon, especially for summer crops.

A starter on fall-sown small grain serves quite a different purpose. Often, the stand we get of wheat will largely determine the yield. The shot of fertility in a starter may give us a much better stand, thus the crop will fare better thru winter.

Land leveling is being forced on farmers using large equipment. Where 4-row equipment, 12-ft. disc harrows and 12-to-16-ft. combines are the rule, there is increasing interest in land smoothing. Farmers in areas with "low spots" or "pot holes" will use land planes to make machinery operation more efficient. Some farmers will use scrapers to level land they plan to irrigate.

Starter fertilizers also are much more important on early-planted corn than on late-planted corn. Earlier in the season the soil is colder, less plant food is released naturally. Usually, the soil is damper earlier in the season too. On late corn there's not so much need for the "shot in the arm."

The type of soil also may de-

cide whether a starter should be used. A starter is needed more on wet, "cold" soils.

Phosphate is one of the most important ingredients in a starter fertilizer. Actually, there's not much point in using a starter fertilizer with a high nitrogen content—says Mr. Falloon.

Now, here's another highly important point—the rate of application of a starter is not very important. A little "dab" may serve just as well as a heavier application. Certainly 100 pounds to the acre is plenty. Perhaps you can spread your starter applications over more crops.

Some of the most spectacular results from use of fertilizer in recent years have been with use of nitrogen. This is especially true on bottomland soil or other soil of high mineral fertility. In many cases your soil may contain enough nitrogen for low yields—

One inch of topsoil blown or washed from one acre of ground amounts to approximately 162 tons, soil conservationists say.

but not enough for high yields. Thus, if nitrogen is the limiting factor on fertility, a small amount of money spent for nitrogen may pay big returns.

Mr. Falloon points out that the trend in Missouri is toward using fertilizers with a 1-1-1 ratio — such as 12-12-12. The farmer who uses such an analysis of fertilizer may be heading for trouble thru the years. Normally, Missouri soils need more phosphate than the other two minerals. A 1-1-1 ratio fertilizer, however, is an excellent analysis to use when rock phosphate also is added to the soil.

Top-dressing of small grains with nitrogen fertilizer is a popular practice and one that gives immediate returns. How much should be used? Mr. Falloon suggests using 100 pounds of ammonium nitrate, or its equivalent, if the level of fertility is not very high. But if the fertility is present in the soil, a second 100 pounds may pay, too.

What about fertilizing for the real high yields of corn? Where is the practical limit? Mr. Falloon is of the opinion if 100 pounds of nitrogen, in any form, will produce 100-bushel-to-the-acre corn it's a good investment.

Does it pay to fertilize grass crops? Normally, grass returns less profit than other crops, so if money is to be spent for fertilizer it can better be spent on crops with a higher return.

But there are many exceptions to this. Perhaps you need pasture badly and have a limited acreage. Then fertilizer will give your grass an extra boost.

Long Lived Alfalfa

Keep that good stand of alfalfa as long as you wish . . .

Condensed from Crops & Soils

O. J. Attoe and *A. E. Peterson,*
University of Wisconsin

TEN years of alfalfa from a single seeding? Sounds like a pipe dream, doesn't it? But soils men are showing us how it can be done.

The answer on most soils, according to Wisconsin specialists, is a *full feed* of fertilizer following *adequate liming.* They say it is also important to use varieties that are winter-hardy and that resist bacterial wilt. These agronomists should know, because they've been able to maintain a beautiful, productive alfalfa field for 8 years, and the average yield has been 3½ tons annually since 1947.

Before liming and fertilization, the Spencer silt loam of this test field ranked as one of the most acid and least fertile soils in the region. Few soils are as unfriendly to alfalfa, and the winters in this northern Wisconsin area are as severe as any encountered in the U. S.

All in all, the picture prior to 1947 didn't look good for alfalfa, and some farm advisors felt the general area was wholly unsuited to alfalfa culture. But now, only 8 years later, they're telling the farmer he can keep a good field of alfalfa productive about as long as he wants to.

The question of how long alfalfa stands will last is one of great importance to many farmers. It is common practice to plow up alfalfa after 2 or 3 years and to plant corn or other cultivated crops.

Where corn is not a sure crop, or where erosion is likely to be serious, it is often to the farmer's advantage to keep stands of alfalfa over a longer period of time. This reduces annual costs for seed and tillage and provides good protection for the land.

The reason many farmers plow up their alfalfa after the second or third year is that the stands become too thin and unproductive to keep longer. Thinning

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stands are usually due to starvation, ice sheets, insects, disease (particularly bacterial wilt), or poorly adapted varieties.

There is a lot of experimental evidence to show that, when provided with adequate nutrients and favorable soil conditions, alfalfa will often survive otherwise unfavorable conditions, particularly severe winter weather.

The 8-year old stands in northern Wisconsin are growing in experimental plots which were established on limed and fertilized land in 1947. The total acre yields of hay during the 7 crop years were over 25 tons. The check plots, with no fertilizer or lime, yielded about 11 tons, mostly timothy and quackgrass.

The prospects are that the limed and fertilized plots will continue to grow crops of alfalfa for several years to come. The quackgrass which was present on these plots from the start has made little or no headway in competing with the alfalfa.

Most of the hay produced on the Spencer soil area is a mixture of timothy and red clover the first year and timothy and quackgrass the second year. Poor yields are common, and farmers frequently must purchase hay at a cost of $25 to $30 a ton to feed their dairy cows.

The alfalfa was established on plots that had been limed and fertilized to different levels. The most satisfactory initial treatment from the standpoint of economical production was about 5 tons of ground limestone and 500 pounds of 0-10-30 fertilizer. Both lime and fertilizer were thoroughly worked into the soil before sowing the alfalfa and oats nurse crop.

Ladino Forced Out

The seed mixture was 10 pounds per acre of Cossack alfalfa, ½ pound of Ladino clover, and 2 pounds of timothy. Because of the heavy growth of alfalfa on the limed and fertilized plots, practically no Ladino clover survived. In favorable years, some of this clover did grow on the unlimed plots where there was little competition.

Starting in the fall on the second-year hay, muriate of potash was top-dressed at different rates. In most cases, 200 pounds per acre of 0-0-60 on limed land gave nearly maximum yields. The alfalfa that did not receive the topdressings soon became stunted and later died out from winter injury.

It is of interest to note, in this connection, that the alfalfa crowns on the limed and fertilized plots contained more than twice as much water-soluble protein as those on the check plot. This substance appears to protect the plant against damage dur-

ing hard freezing weather.

Transform Phosphorus

One of the important benefits that come from liming acid soils is the transformation of some of the unavailable phosphorus naturally present in the soil to forms that are available to the plant. Usually, acid soils contain 500 to 1000 pounds per acre of phosphorus in the form of iron and aluminum phosphates and organic matter.

The results of the experiments indicate that about 9 pounds of phosphorus per acre per year may be thus transformed to an available form and used by the crop over a 10-year period. This is the equivalent of about 100 pounds per acre annually of 0-20-0 fertilizer, valued at about $2.00.

May Need Boron

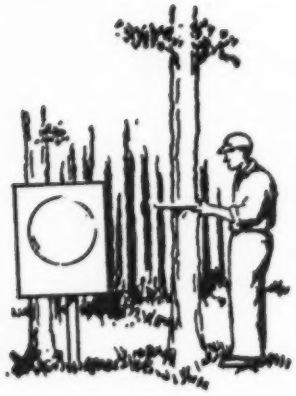
In many cases, topdressings with fertilizer borate are needed, either alone or in a fertilizer mixture such as 0-9-27B. Sandy soils and soils low in organic matter may not contain enough boron to supply the needs of the crop properly. If boron starvation symptoms are likely to occur, application of fertilizers containing borate should be made. Usually, the other trace elements are in adequate supply.

One good way to stop the spread of weeds is to stop planting crop seed infested with weed seed.

The Spencer silt loams are similar to many other acid, low-fertility soils throughout the North Central and Northeastern States. They have been thought of, however, as being harder to manage than most such soils. The demonstrations in Wisconsin are convincing evidence that they are productive and that, with proper treatment, they are capable of growing alfalfa for long periods of time.

A comparison of farming operations shows that good farmers in Missouri get 18 times as much work done as farmers in Greece. Wages in Greece average 84 cents a day. In the United States, the average is $5.30. It costs the Greek farmer $15.12 to get as much work accomplished as the Missouri farmer can get done for $5.30.

This fact is an encouraging development for farmers on comparable kinds of land. For if alfalfa can be grown on the Spencer soils of northern Wisconsin, this great crop can also be grown in many other areas where, up to now, it has not been given a real trial with intensive soil treatment.



Money From Your Trees

Can your farm woodlot qualify as a Tree Farm? It can bring a good income if properly managed . . .

Condensed from Soil Conservation

Franklin Bradford

INTEREST in tree farming—the growing of timber as a crop—is gaining throughout the country. Thirty-six states now have active Tree Farm programs under the American Tree Farm System. The system added more than three and a half million acres of woodlands last year.

Behind this increasing fervor for forestry lies the basic stimulant of good markets. Unless the farmer can sell his saw logs, his fence posts and his Christmas trees, he has little incentive to investigate woodlot management. For geographical reasons, there isn't always a local market for timber, yet the overall market outlook is bright.

Wood is already going into more than 6,000 items which affect our daily lives, and the technological experts tell us we are only beginning. The chemist's test tube holds the answer to many new uses for wood.

There are some 4¼ million "small" land-owners in the nation today. They hold 57 per cent of the country's land, and each year sell 700 million dollars worth of saw logs, pulp wood, posts, turpentine, Christmas trees, maple syrup, and other forest products.

Because these small landowners control most of the nation's commercial forest land, it is clear that increasing demands for wood open the door to greater opportunities for producing timber as a cash crop. The farmer who has paid little or no attention to his woodlot might well look into the advantages of forest management.

Tree farming simply means growing timber as a crop. The American Tree Farm System is an industry-sponsored program

Reprinted from Soil Conservation, Washington, D. C.

through which good forest management is publicly recognized. When a land owner feels that he is managing his woodlot wisely, he may apply to his state Tree Farm committee, which will arrange to have the woodlot inspected. If the inspection by a recognized forester shows management measures up to principles of the System, the landowner gets a certificate, also a Tree Farm sign which he may display on the land.

Whether a landowner joins the American Tree Farm System or not, he may reap cash benefits from a well-managed woodlot. If he applies for Tree Farm certification and gets it, his woodlot then simply wears the "Tree Farm" sign and stands as an example to others. This way the tree farmer is encouraging other landowners to grow trees as a crop.

Under the principles of the American Tree Farm System, the landowner must protect his woodland from fire, insects, and excessive grazing. He must harvest timber in a manner to insure continuous crops.

The System is administered by American Forest Products Industries, 1816 N Street, N.W., Washington 6, D.C. Industry committees administer it in the various states. Those who desire information about the Tree Farm program in a given state may write AFPI in Washington. There is no membership fee or dues. To retain his certified status, the landowner must maintain good management of his woodlot. This is determined by periodic inspections.

The landowner who has never sold timber might begin by discussing his problem with a trained forester, one of some 15,000 in the country. The forester can cruise the timber and determine steps needed for sound management. There's a good chance that the woodlot needs an immediate thinning. This means that diseased and crooked trees may be removed and marketed. Not only will this provide income for the farmer, but it gives the sounder trees more "growing room." The growth of these remaining trees is much faster than before the thinning.

As time goes on, the farmer may select mature trees for cutting, or he may cut others for pulpwood, fence posts, fuelwood, or general farm use. Once his "stock" trees have been established, he can figure on periodic harvests based on selective cutting.

Keeping fire out of the woods is of paramount importance. Years of careful management can go up in smoke if the farmer doesn't take every precaution against this No. 1 enemy.

Some of the industries have

their own Tree Farm "families." Under the "family" plan, an industry, such as a sawmill, provides free forest management services to a large number of smaller landowners in return for which the landowners may give the company first shot at buying the timber when it is mature. Some of the "family" plans are no more than gentlemen's agreements. To the non-resident landowner, the plan has many advantages. To date there are relatively few industries using the family plan, but those who are find it highly successful. It is a step toward stabilizing their future timber supply without the necessity of heavy land-buying programs.

Grain Feeding Pays After Pasture

When beef cattle come off summer pasture, it pays to "feed them out" to market weight with grain in drylot. How much it pays was demonstrated at the University of Minnesota's Beef Cattle-Grassland farm.

Steers that came off pasture in September, 1954, placed on dry lot and fed grain up to 120 days gained an average 378 pounds per steer—that is, from 577 to 955 pounds—and sold for an average $216.31. Each steer cost $173, figuring his original price and feeding cost to market weight. Profit over feed cost: $43.31. Even steers fed on drylot until March 1, 1955, gave an average $42 profit.

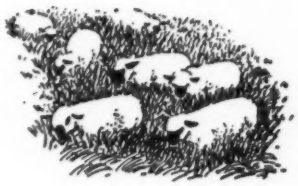
In contrast, a group of steers marketed just after coming off pasture in September, 1954, brought only $17.84 net profit, average, per steer. Their total cost to market time: $139, selling price: $156.84.

Part of the increased profit per steer came as a result of an increase in the grade caused by grain feeding. For example, steers kept on dry lot 120 and 150 days after coming off pasture brought $22.65 a hundred.

Dry lot feeding raised carcass grade, increased dressing percentage, selling price per hundred pounds and margin per steer over feed costs as long as it was carried on—up to 120 days. Then, profit began to drop slightly, according to A. L. Harvey, professor of animal husbandry at the University of Minnesota, who supervised the tests.

Here are the figures for the other groups: steers kept on dry lot 30 days beyond coming off pasture sold for $20.90 per hundred pounds; steers on dry lot 60 days beyond sold for about the same. The drylot groups got 1½ pound of linseed oil meal per head per day with a full feed of corn and cob meal and alfalfa hay.

Ohio's Sheep Improvement Program Really Improves



How Ohio sheepmen are making excellent returns on their sheep dollars . .

Condensed from
Sheep Breeder and Sheepman

WOULD you be satisfied with a gross return of $220.50 per livestock unit from your sheep flock? That is the kind of record you would have to make to equal three Ohio Commercial sheepmen. An animal unit consists of six ewes.

Robert Bollenbacher, Lowell G. Van Schoik and Walter Grener, and Jack Donahue, won the Ohio Commercial Ewe Flock awards sponsored by the Ohio Sheep Improvement Association. These sheepmen had a gross income from sale of lambs and wool of $36.79, $37.01, and $36.43, respectively, per brood ewe exposed to the rams in the fall of 1953.

The awards are made each year to stimulate interest in a profitable sheep husbandry program, says Agricultural Extension Specialist, Ralph H. Grimshaw. The program is divided into three groups—brood ewe flocks of 20 to 30 head, 51 to 100 head, and 101 head and upward. The program stresses pounds of quality lambs marketed per ewe exposed to rams plus pounds of quality wool marketed per ewe. Each flock was graded on a score card that gave 75 points for highest gross returns per ewe, 15 points for desirable feeding and management practices and 10 points for information in records furnished.

Average production of all the 1594 Ohio Commercial Flocks cooperators during 1954 were:

115 per cent lambs marketed per 100 ewes exposed to rams.

100 pounds of lambs per ewe exposed.

10.0 pounds of wool per ewe.

$25.93 gross sales of lambs and wool per ewe exposed.

Robert R. Bollenbacher was winner in the 20 to 50 ewes class. Gross returns per ewe exposed in Bollenbacher's flock was $36.79 or $220.74 per animal unit. His 40 ewes raised a lamb crop of 155 per cent. An average of 154 pound of lambs and

Reprinted by permission from Sheep Breeder and Sheepman, Columbia, Missouri

11 pounds of wool were marketed per ewe. Ewes were treated with phenothiazine-arsenate drench in the fall of 1953 and again in the spring during April 1954.

Lambs and ewes were treated during the summer. Phenothiazine mixed with salt was kept before the sheep all summer.

Blue grass pasture was used for early spring and late fall pasture. Lambs and ewes were rotated every three weeks on two meadow fields of alfalfa and brome grass. Majority of lambs were finished on pasture alone. A grain mixture was fed to the ewes, beginning four weeks before first ewes were due to lamb. After lambing the ewes were fed two pounds of grain per day to make plenty of milk.

Robert's brood ewes are Western crossbred ewes and Dorset crossbred ewes. He uses Dorset purebred rams.

In the 51 to 100 Commercial Ewe Flock group, Jack R. Donahue, Route 1, South Solon, Madison County, was the first place winner. This sheepman had an average gross return of $37.01 per ewe, or $222.06 per animal unit. The northwestern crossbred ewes were bred to Shropshire and Southdown registered rams. A lambing percentage of 157.3 per cent produced a flock average of 138 pounds of lambs and 13.7 pounds of wool per ewe. Mr. Donahue stated that the ewes and lambs were rotated in three fields of alfalfa, ladino, and timothy pasture. Blue grass pastures are used during winter and early spring. The lambs were topped out and sold through Madison County Lamb Pool.

The top flock in the 101 ewes and upward class was a flock owned by Walter Grener and managed by Lowell Van Schoik. The Grener and Van Schoik flock returned a gross return of $36.43. Their 109 western crossbred ewes produced 184 market lambs for a lambing percentage of 168 per cent. They marketed 143 pounds of lambs and 10.2 pounds of wool per ewe exposed to ram. Four registered Southdown rams were used.

The National Safety Council says that farming is the third most hazardous of all occupations.

No ewe lambs are saved for flock replacement purposes. This flock of ewes are regularly drenched each fall, early spring, and two times during the summer. Phenothiazine salt is free choice fed during the summer time. The rotation pasture and hay harvested for the sheep flock is a ranger alfalfa, ladino, and brome grass mixture. Blue grass is used in early spring and fall. This flock dropped nine sets of triplets.

WATER · Got Enough to Irrigate?

Plenty falls from the skies. All we have to do is save it. Here are some interesting ideas on how we can . . .

Condensed from Farm Journal

George W. Wormley

ALL of a sudden, everyone is interested in water.

Missouri's irrigated acreage has leaped 440% in four years. Virginia farmers put in 110 new systems in the first six months of 1954. Georgia has almost tripled its irrigated acreage in the last two years—now has more than 1,000 systems.

So it's going, all over the Midwest, East, and South.

You don't have to look far to find the reason for this irrigation boom. Droughts have made us more "water-conscious." Then, too, irrigation is one big way to increase production, and still stay within acreage controls. And finally, there's the new Water Facilities Act to help farmers finance irrigation.

But farmers aren't the only ones interested in water. Towns and cities are beginning to look upstream for the water they need, and they're beginning to compete with farmers for it. So the big question facing everyone is: "Will there be enough water?"

The geologists are reassuring. There's plenty of water, they say, if we'll just learn how to save it.

"We're only using about one-seventh of what we get," says Carl G. Paulsen, chief hydraulic engineer for the U. S. Geological Survey.

In the 31 states east of a line from the western edge of Minnesota to the western edge of Louisiana, the rainfall that doesn't evaporate totals about 16 inches per year—a whopping 900 billion gallons per day.

In the 17 western states, it's only four inches, or 350 billion gallons a day. But by pumping and by building canals and reservoirs, the West is making use of about 95 billion gallons daily —20 billion more than the East.

So it doesn't look as if easterners will have to worry much about running out of water. The catch comes in getting the water where you want it.

Western farmers have found

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

that artificially distributed water comes high. Even with special crops they can't compete with a city like Santa Barbara, Calif., which now pays $50 an acre-foot.

Your cheapest water supply is probably a small, near-by stream. But it's also the least dependable.

Likely as not, it'll dry up just when you need it most. Or you'll hear a yell from down stream as soon as you start using it. If your down-stream neighbors do not complain, towns and cities will.

"But if you can pump from a large stream, or from an underground source without damaging other users," says SCS Engineer T. H. Quackenbush, "there's no reason why you can't get started."

Whatever your source of water, the sooner you act, the better. In the West, water usually belongs to the farm that started using it first. And there's a good chance that eastern states will work some kind of priority protection into the laws that many of them are now writing.

Is there enough water under your farm to irrigate?

You can probably get some idea by asking your state geologist or resources commission. You may be surprised by what you find.

Parts of Indiana and Ohio, for example, are under-lain with old water-filled river beds. Farmers in Dunklin County, Mo., called in engineers to organize a surface irrigation project, and discovered that they could sink wells on their own farms and pump all they needed.

Of course, there isn't enough water under every farm. "But there's a lot of places where ground water can be developed," says Paulsen. "And where it is available, ground-water storage is both cheap and practical.

Reservoirs may be used when you can't store water underground, but both Paulsen and USGS Scientist K. A. MacKichan believe that we can keep future irrigation costs down by taking advantage of underground gravel beds, or "aquifers"—water-holders.

Californians along the Los Angeles River have built low rock-and-brush barriers, to spread streams out and recharge their ground water supply.

So the talk that we hear about running out of water isn't backed up by long-time records for most of the country, even though there are local shortages.

Scientists say that many farmers in the 31 humid states may be able to pump from an underground source for supplemental, if not full-scale irrigation.

We'll just have to take the necessary steps to catch and distribute more of the water that we get.

What They Learned About Caged Layers

A carefully controlled test gives practical facts and figures on the advantages of putting hens in cages . . .

Condensed from New Jersey Farm and Garden

William Haffert, Jr.

ADD up virtually every penny of cost, including depreciation on building, equipment, medication, etc., and you could have pointed to a labor income of about $2 a bird for a cage layer system in a "depression year" like 1955.

That was the experience, at least, in an experimental unit of 360 cages maintained at Vineland Poultry Laboratories in Vineland, New Jersey, in which very careful records were kept from December 1, 1954, to December 1, 1955.

Dr. Tevis M. Goldhaft, manager of the Vineland Poultry Laboratories, was supervisor of the test.

Dr. Goldhaft believes the cage system will come into gradual use, but not overnight, nor will it ever fully displace floor bird management.

"It lends itself more readily to 'A' type buildings, and most of ours are shed type," he observes. "Besides, people don't change habits overnight.

Dr. Goldhaft said he now believes, based on his pilot operation, that husband and wife could care for a flock of 5000 birds in cages, in addition to raising 1000 replacements four times a year.

If he's right—and he admits it would take a large-scale field trial under local conditions to check him out—then that family would have netted $10,000 labor income in 1955, including sufficient depreciation to rebuild their plant every 10 years and to replace equipment every five.

Before examining the records of this trial project, note some of Dr. Goldhaft's general observations:

● From a broad viewpoint, a cage operation has many advantages over a floor plant. It is a

Reprinted by permission from New Jersey Farm and Garden, Sea Isle City, New Jersey

clean and accurate method of handling layers.

● The poultrymen can check the record of each bird. Thus, should the cage system become popular, breeders and hatcherymen who supply chicks for replacement laying stock certainly would "have to keep on their toes."

● The nutritional problems of 25 years ago seem to have been overcome with present-day laying feeds. Present cage all-mash rations appear to be fully capable of sustaining birds without nutritional deficiency.

● Although the usual run of chronic poultry diseases which exist among floor birds certainly can, and do, appear among cage layers, individual housing permits the operator to spot and cull instantly. This is not always possible among floor layers.

● Mortality appears to be a very minor factor. In other than acute deaths, most of the birds that would die can be sold while marketable. This salvage value often is lost in floor birds because often they are not culled out soon enough.

● A very noted advantage is the flexibility of caretaking. Feeding is a once-a-day chore which can be done by anyone who can put feed into hoppers. Collection of eggs is a once or twice-a-day necessity, depending on the weather. Most eggs are completely clean and need no care other than grading and packing.

● Culling is simple. Dr. Goldhaft did his every other Friday. There is an inexpensive counter on each cage. He simply went down the aisle and read the counter to see the total number of eggs laid at each cage. Any bird whose production was less than seven eggs in a 14-day period went to the butcher (incidentally, he saved enough culls to satisfy himself that most of them never would have come back into profitable production—contrary, by the way, to what he had anticipated.

The year's experience produced some interesting problems, most of which were solved —or could have been.

Most annoying, reported Goldhaft, were the soft, wet droppings during the summer months. The entire floor was cement. If he could have done it over again, he would have used cement only for the aisles and have left a "dirt floor" beneath the cages. He feels this would make it easier to remove droppings and that the dirt would absorb excess liquids.

Another big problem was fly control in summer. This was overcome at first by using malathion fly bait in the droppings, but after a 30-day trial it was abandoned in favor of less-expensive lindane. The lindane

was sprayed weekly on the droppings, walls and around windows and doors. Results were "most satisfactory."

When the project was first started, a number of floor birds already in production were put into cages. But after two or three weeks, they would quit and go

with two layers of 30-ply felt paper and hot tar. The lower half of the side walls was covered with one-half inch asbestos sheets. The upper half of three sides of the room had plastic windows which could be opened and closed. (He used his own labor and built the house for

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they had been floor-reared and had picked up roundworms. Also, the birds were individually treated for lice. A small dab of blue ointment was placed in the feathers below the vent and under each wing.

The cage unit was set up in a room 30x50 feet in an "A" type house—1,500 square feet, the equivalent of three square feet per layer. The house had a four-inch cement floor and the sidewalls and roof were wood-framed. The roof was covered

to escape. Dr. Goldhaft said that ventilation was adequate and that there was never an odor problem. He felt that a shed type roof would be less desirable.

Three hundred and sixty pullets of a closed Leghorn strain produced by Vineland Labs were placed in the cages on December 1, 1954. They were just coming into production and were given six weeks to adjust before any culling was done. Thereafter, birds that did not produce at least seven eggs in 14 days were

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It all goes to show that farming is like any other business . . . .

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was sprayed weekly on the droppings, walls and around windows and doors. Results were "most satisfactory."

When the project was first started, a number of floor birds already in production were put into cages. But after two or three weeks, they would quit and go into the equivalent of a neck molt. Some stress factor apparently set in. Thereafter, replacement pullets were "pre-conditioned" in cages in a separate room *before* they came into production—at 16 to 18 weeks. Thereafter a smaller number of them quit when transferred to the egg room.

All other operations were the same as for floor birds, including recommended vaccination procedures. However, the birds were given a worm tablet containing nicotine and phenothiazine when put into cages because they had been floor-reared and had picked up roundworms. Also, the birds were individually treated for lice. A small dab of blue ointment was placed in the feathers below the vent and under each wing.

The cage unit was set up in a room 30x50 feet in an "A" type house—1,500 square feet, the equivalent of three square feet per layer. The house had a four-inch cement floor and the sidewalls and roof were wood-framed. The roof was covered with two layers of 30-ply felt paper and hot tar. The lower half of the side walls was covered with one-half inch asbestos sheets. The upper half of three sides of the room had plastic windows which could be opened and closed. (He used his own labor and built the house for $1,500. It has been charged off at $150 a year for 10 years in income estimate for 1955.)

During the summer, the windows on three sides were lowered at all times unless there was a driving rain. At floor level there was a hinged asbestos board ventilator on the north and south sides—always open during spring and summer. During the winter the north and east windows were kept closed but the south-facing windows were usually open.

There were three roof ventilators in the house to allow foul air in the peak of the "A" roof to escape. Dr. Goldhaft said that ventilation was adequate and that there was never an odor problem. He felt that a shed type roof would be less desirable.

Three hundred and sixty pullets of a closed Leghorn strain produced by Vineland Labs were placed in the cages on December 1, 1954. They were just coming into production and were given six weeks to adjust before any culling was done. Thereafter, birds that did not produce at least seven eggs in 14 days were

culled. Of the original 360, 197 completed the full laying year . . . or about 55%. It was necessary to use 207 replacements, but this was abnormally high because Goldhaft hadn't "preconditioned" some of these floor-grown birds in cages before they came into lay.

Production necessarily had to be based on the cage, not the bird, but the average for the year was 63.4%.

Feed consumption and egg production were directly related, Dr. Goldhaft's records indicated. Daily consumption averaged 26 pounds per 100 birds and feed costs were 22.6 cents for each dozen eggs produced. Egg size was consistently good — nearly 74% graded large in February,

Summary of Income and Costs

Number of bird days	131,400
Number of eggs	83,432
% production	63.4
Feed consumed	34,325 lbs.
Feed cost	$1,576.77
Dozen of eggs per bag of feed	20.2
Daily feed consumption per 100 birds	26 lbs.
Number of birds replaced	297
Feed cost per dozen eggs	22.6
Gross egg return income	$3,311.45
Income on sales of birds	191.11
GROSS INCOME	**$3,502.56**
Expenses	
Total feed cost	$1,576.77
Equipment and bird depreciation	414.00
Building depreciation*	150.00
297 replacement birds @ $1.75 each	519.75
TOTAL COSTS	**$2,650.52**
Profits	
NET PROFIT	**892.93**
Labor income per cage (360 cages)	**2.02**

* Based on $1,500 value, depreciated at 10% a year. It was difficult to estimate insurance, taxes, overhead for truck, etc., such as would occur in commercial operation, because project was conducted on premises of established laboratory. However, Dr. Goldhaft points to fact that same two-hour-a-day labor requirement would easily have carried 1,000 birds instead of just the 360 used in this experiment.

climbed as high as 83% in June, were still at about 78% large in November.

Dr. Goldhaft said that replacements cost him about $1.75 to raise, including a nickel a bird for vaccination and medication. He said replacements should be raised a minimum of four times a year and that his records indicate the need for at least 80% annual replacements — divided fairly uniformly throughout each month.

Birds used had a history of vaccination against Newcastle disease with VIPOL 717 intramuscular vaccine when two to four weeks of age. At 12 to 16 weeks they received laryngo and fowl pox vaccine, followed at 22 weeks by revaccination with VIPOL 717 for Newcastle.

Mortality was light. There were 657 birds involved — the 360 birds originally started and the 297 replacement birds. Yet total mortality was only 31 birds in the 12 months. Sixteen of the 31 either died or were removed from the cages as the result of "blowouts" or prolapse. It proved to be the single major disease problem.

The charts that accompany this story tell the dollar-and-cents story in graphic detail. Dr. Goldhaft included all costs but labor and—if projected to a commercial operation on the same formula that the current Rutgers-sponsored price forecasting panels are held—you would have to shade his $2-a-bird labor income slightly for such things as insurance, depreciation on a truck, electricity and perhaps other minor costs that were absorbed in the total operation of the Vineland Laboratories premises. But Dr. Goldhaft believes that this wouldn't alter total income, even on his pilot operation, by more than 5 to 10 cents a bird.

Farm records are the eyes and ears of the farm business. They see and hear how the business is doing and prevent costly management mistakes.

Dr. Goldhaft likes the cage layer system for his own purposes, because it gives him closer control on selection and breeding of his foundation stock—the stock used for experimental purposes. He has handled floor birds, and his father before him, for a full generation. He feels the cage system is sound and profitable. But he can't and won't pass judgment on whether cage layers will be accepted by the general poultryman in New Jersey.

"I hope this report will stimulate thought," he says. "Only time and further trial — on a much broader basis and under fully commercial conditions— will answer the question to general satisfaction."

Progress Report on Plastic Silage Packages

Gas tight plastic silos show promise for relatively small quantities of high quality silage . . .

Condensed from New Jersey Agriculture

Professors M. A. Sprague and *C. H. Reed*
New Jersey Agricultural Experiment Station

THERE may be a new wrinkle in silage making on the farm if experimental trials with plastics continue to show as much promise as they have in New Jersey during the past four years.

Plastic silos will probably not replace the need on many farms for present-day structures, methods, and equipment. However, at present they appear to be practical for putting up relatively small quantities of a very high quality silage for feeding in out-of-the-way places.

The greatest benefit in using plastic materials is derived from their gas-tight characteristics. Although they are very slowly permeable to numerous gases, quick-sealing after filling permits the rapid establishment and maintenance of anaerobic conditions inside the bag. This prevents mold growth, limits respiration and temperature rise, holds dry matter losses to a minimum, and encourages the retention of carotene and protein.

Equally valuable is the adaptability of plastics to various size packages dictated by the supplies of forage and feed requirements on a particular farm. On many farms delay in silage making until all pasture fields are ready to cut at one time offers problems in over-maturity, losses in stand, poor seasonal production and a grazing schedule out of control. In addition, many farm operations have need for silage in amounts ranging from 25 to 70 tons. These relatively small quantities may be used for feeding small herds or flocks, certain types of animals separate from the main herd, or for use during short periods such as midsummer when pasture may be short.

The plastic materials most successfully used to date have been polyvinychloride and polyethy-

Reprinted from New Jersey Agriculture, New Brunswick, New Jersey

lene sheet materials. Spray applications of plastics have been tried and discarded as impractical. Several other materials, some of which are very strong and offer considerable promise, have been tested on a small scale. Most of the experimental materials have been of .008-inch thickness. Thinner materials proportionately cheaper are currently being tried.

A tight seal from the atmosphere is required. This has been accomplished with a complete envelope of plastic and by carrying the plastic under the stack a small distance, thus relieving the necessity for a complete bottom. Effective stacks have been built with from ½ to 67 tons capacity.

Reduces Spoilage

Of particular interest is the prospect of reducing spoilage and dry matter losses from the usual 15 to 30 per cent experienced on farms. In one of our tests, eight plastic silos of 1,000 pounds capacity each were filled with sorghum, and an additional eight were filled with alfalfa. The dry matter losses in these 16 containers averaged less than 5 per cent. If seepage from these packages had been appreciable dry matter losses would likely have been slightly higher.

In this study low dry matter losses may possibly be associated with the low temperatures maintained during preservation. Thermocouples placed at intervals throughout the forage have indicated that the maximum temperature rise in any of the silos put up to date amounted to only 18° F; the average rise was only 9°F. Temperature rises in normal farm operations sometimes reach 40°F.

Silage is a fermentation product but temperature rise is due primarily to respiration which continues after the forage is cut and until the available oxygen is exhausted. High temperatures cause the destruction of carbohydrates and encourage the breakdown of carotene and protein.

The engineering aspects of how to contain the material in a neat, effective package of appropriate size are very important and much work needs to be undertaken on this problem. Our trials have utilized as many as eight basically different methods of building the stack with varying degrees of success.

One of the most promising methods recognizes the inherent capacity of the chopped fibrous material to bind itself into a stable mass. Accordingly, a round stack with nearly vertical sides which will maintain its shape effectively without sup-

port can be built within a snow fence ring or other suitable form. In building such a stack we presume the height should not exceed the diameter.

The plastic bag is rolled or gathered like a stocking. It is then placed on level ground. The lower edge is extended toward the center about 3 feet, and the form is put into place. Chopped forage is then blown into the form and this first layer, in particular, is distributed and packed evenly.

After the snow fence ring has been completely filled it is removed, shortened to form a ring 2 feet less in diameter than the first ring and mounted atop the stack. The second layer is then filled and packed like the first and followed by the third which also is shortened in diameter. After the top ring is removed, the plastic film is raised and tied *tightly* with a stout cord. In working on the stack care should be taken not to walk too close to the edge after the forms are removed.

Gases begin to collect immediately upon sealing and the bag reaches its maximum extension in approximately 36 hours, after which it slowly collapses. We have never had the plastic fail from pressures developed. However, unless secured firmly the knot at the top may pull out, in which case it should be retied as soon as possible. Openings should be made at the base of the bag on at least two sides to permit seepage. As soon as the seepage stops these holes should be wiped clean with a dry cloth and covered with a piece of pressure tape, or the plastic gathered into a small knot and tied with a string.

Preliminary figures based on present volume prices at retail levels place the cost of .008-inch polyvinylchloride plastic including fabrication for use in 30- to 40-ton packages, well within practical limits. Thinner materials, cheaper plastics and possible reusability for more than one year, if proved practical, would lower costs proportionately.

The best way to keep up with your neighbors is to take it easy for a while and in a few years meet them coming back.

Before practical applications for the farm can be recommended, however, further studies of pilot-plant-sized silos must be made on many farms to evaluate such problems as durability of plastics, rodent damage, and the economic aspects. Cooperative studies are already underway in Minnesota and Mississippi.

"Battling Bossy" Not Contented!

Every cow has a place on the bovine social ladder, but she gets there only through fighting. Add new cows to the herd and the milk flow may drop 5 per cent . . .

Condensed from Hoard's Dairyman

Frances Andrews Vernon

DAIRYMEN already know that cows are not the placid animals they are cracked up to be. Like people, cows vary in disposition from mild, through fidgety, to "downright ornery." And, like human beings, some cows are leaders; others are followers.

Dr. M. W. Schein has observed a herd of about 150 dairy cows at the Iberia Livestock Experiment farm near Jeanerette, Louisiana. Basing his study of bovine behavior on previous scientific studies of other animals, he has delineated a caste system among dairy cattle. It brings out that one cow, at least, can rightly be called "Old Bossy."

In every herd there is one cow that dominates the rest. The others descend the social ladder in the manner of the poultry-peck order.

And, according to a chart worked out by Dr. Schein, rank is established by a succession of physical conflicts among herd members with the oldest, heaviest, and generally senior member of the herd coming out top cow.

Of economic significance is Dr. Schein's finding: When the established social order is broken by an ambitious upstart or a stranger cow, fighting among a number of cows starts, with consequent drop in milk production.

In a recent experiment, Dr. Schein, assisted by C. E. Hyde, recorded a decline of more than 5 per cent in milk production when a group of stranger cows was intermingled with a herd already familiar with each other and belonging to an established caste system.

For the study, Dr. Schein selected 27 cows — half of them Jerseys and the other half Sindhi-Jersey crossbreds—from the milking herd of the experiment farm. All of the animals were in second or later lactation, 30 to 260 days after calving, and had produced at least 450 pounds of milk during the preceding month.

Twelve of the 27 animals were used as controls and remained

Reprinted by permission from Hoard's Dairyman, Fort Atkinson, Wisconsin

with the herd. Fifteen were moved into a new pasture. Both the control group and the experimental group of 15 had about equal numbers of purebred Jerseys and crossbreds, so breeding had no bearing on the results of the experiments. Daily milk records, of course, were kept on all the animals.

After the 15 experimental cows had had time to adjust to their new pasture, 35 heifers and cows, strangers and semi-strangers in that the older animals had not been with the 15 cows for at least six months, were introduced into the pasture. A period of fighting for dominance followed.

According to a continental story a man died and left $100,000 each to an Englishman, an Irishman and a Scotchman, on condition that each put $10 in his coffin. The Englishman dropped in his $10. The Irishman did likewise. Then along came the Scotchman who put in the coffin a check for $30 and took out the $20.

After six days, milk production averages were tabulated and showed a decline of 5 per cent beyond the normal persistency decline. The milk production records were not affected on the 12 control animals left with the original herd.

Dr. Schein and his assistant, Jeffrey Vizinat, made their observations in this and other bovine behavior studies from the top of a truck driven inside the pasture. Since the men visited the pastures almost daily, and were accepted as part of the natural surroundings by the cows, their presence had no effect on the aggressive behavior of the cows.

Altogether, Dr. Schein and Vizinat recorded more than 5,000 fights while charting the caste system among cows and noting the effect of conflicts upon milk production.

In Dr. Schein's estimation, cows are anything but contented. "In fact," he said, "the contests were so frequent, it was necessary for one of us to call out the herd numbers of the contestants and the outcome while the other recorded the facts. Sometimes there were so many hassles in progress at the same time we could not record them all."

In order to analyze the conflicts, Dr. Schein separated the contesting activities of the cows into four phases: (1) The approach, which might be either passive or active; (2) the threat; (3) butting; and (4) fighting.

The *passive* approach covers encounters where neither animal takes issue with the other.

The *active* approach implies purposeful aggressive behavior:

Head lowered; slow, deliberate movements toward the introduced cow. Unless the approached cow retreats, it is safe to say a fight will ensue.

The *threat* then follows when the two animals are within five feet of each other and at least one of them exhibits aggressive behavior: Head lowered to halfway between normal position and the ground, eyes directed toward the opponent and forehead perpendicular to the ground. Cows at the Iberia Livestock Experiment farm are dehorned at birth, but the *threat* movement suggests the instinct to gore an opponent. At this stage, the threatened animal usually retreats. Occasionally she accepts the challenge.

Threats are, by far, the most common type of contest recorded. Only about 10 per cent of the contests go further.

For this study, *butting* is defined by Dr. Schein as the action of one animal using its forehead to hit another, with no retaliation.

Fighting, of course, is when the attacked cow fights in return.

Dr. Schein awarded the victory to an animal at any point in the conflict when the opponent retreated permanently.

He observed, however, that a good many fights consisted of more than one encounter and some were violent enough that, if permitted to continue, they might have resulted in injury. Actual encounters lasted no more that a minute at a time with one animal taking temporary flight to gain better position. Two well-matched animals often struggled for supremacy for a period of hours, and days.

One fight pattern which Dr. Schein observed he termed "the clinch." This was used when two animals, head-to-head and maneuvering for flanking position, showed signs of fatigue. Suddenly, the less-aggressive would let her opponent slip her head into her flank but, at the same time, she would turn her body in order to be parallel to the aggressive animal. The less-aggressive cow would then lower her head to a position between the hind leg and udder of the aggressor. In "the clinch" neither cow would deliver a telling blow.

Practical conclusions to be drawn from Dr. Schein's study are that cows, like people, react physically and emotionally to discord and competition; and for productive dairy cows an environment that minimizes fighting should be provided.

Cows should be pastured or stabled in such a manner that each one gets her fair amount of feed. Where there is serious feed competition, the top cows thrive and the timid ones suffer. In loose housing, common to the

South, the less-aggressive animals lose out unless ample trough space is provided.

The total accumulation of surplus farm products over eight years is about equal to a fourth of one year's production. But these surpluses have caused net farm income to drop 28 per cent in the past three years.

Dr. Schein also observed that young animals showed little aggressive behavior toward each other until they are about 3 or 4 months old. They are curious creatures and will gather about a strange object or person to observe and sniff but not to molest.

In later calfhood their conflicts begin and they establish a caste system among themselves which endures as long as the herd stays together. Little squabbles happen occasionally—perhaps to break the monotony — but they end up with the same victor and with the herd order intact.

For the general tranquility of a herd, Dr. Schein believes it is desirable to keep the same herd together as long as possible. If it is necessary to introduce newcomers, it is practical economy to do so when milk prices are down, and when an upset in the herd will not show up in a loss of dollars and cents.

Rotational Farming Gets Most Per Acre

Rotational crop systems give the farmer a bigger feed return per acre than permanent pastures. That's the conclusion of University of Wisconsin forage crop specialists after 12 years of rotation experiments.

Agronomist M. J. Wright reports that annual production of total digestible nutrients (TDN) from fields of even top quality permanent forage was 400 pounds or more lower than fields in six-year rotations. From 1944 to 1955, permanent bluegrass averaged about 1,150 pounds of TDN per acre, and land that was renovated periodically with alfalfa and red clover produced 1,700 pounds.

A six-year rotation of corn, oats, and four years of clover-grass averaged 2,111 pounds, and another six-year rotation of corn, oats, and four years of alfalfa-bromegrass produced 2,446 pounds of TDN per acre. *Wisconsin Extension*

How To Appraise A Farm

In just seven steps, this article tells how to figure the practical value of your farm or a farm you may want to buy . . .

Condensed from The Young Farmer

Professor W. G. Murray,
Iowa State College

YOU have a chance to buy the Smith farm at $165 an acre—a total of $33,000 for the 200 acres. And you're asking me what I think of the price.

Your five years as a tenant, following a tour of duty for Uncle Sam, have seen your debts paid and a small nest egg accumulated. You want to buy a farm but are puzzled at how to determine a reasonable price to pay for the Smith farm—or for any other farm.

Here's the problem in a nutshell—how do you figure the value of a farm? How can you be sure that you are not paying too much? There are principles that can guide us in getting an answer. And to show how these principles are used, let's appraise the Smith farm.

The first step is to do some poking about in the county seat town. You will be surprised at the information about any farm hidden away in deed, mortgage, and other court house books. An abstract of title gives you the book and page numbers for much of this information. But index and other transfer books can also show you how to uncover the history of the farm being appraised. How many times has it been sold and at what prices? Has it ever been involved in foreclosure proceedings?

You can get data on assessments, taxes, drainage districts, and the like at the court house in most cases. And you will find a county office where you can see the official land plat with every farm properly noted. You can usually get a soil survey report and map at the county agent's office if a report has been issued and is still in print. You can also get access to an aerial map showing your farm at the County Agricultural Stabilization and Conservation (ASC) office if aerial maps have

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been made in your county and are not restricted.

Armed with all the information available in the county offices, you are ready to take a look at the farm. Here are the steps you should take.

1. Locate the farm and check the legal description. This may appear simple and almost unnecessary but it is actually very important. Incorrect boundary fences and shortages in survey acreage, if not detected at this stage, may lead to litigation or the painful realization that you didn't get as many acres as you thought you were buying.

The Smith farm, according to the county plat book, is three miles north and two miles east of Blank Town.

The legal description of the Smith farm is:

> The SW¼ and the SW¼ of the NW Fr ¼ of Section 3, T'nship 83 North, Range 24 West of the Blank Meridian, containing 200 acres more or less, according to Government Survey.

The term "fractional" is a danger signal, an indication that the tract may not be regular. This is especially true in all the sections along the north and west boundary of the townships in the rectangular survey. In this instance the tract under suspicion is not along the extreme north boundary and consequently is probably not irregular. However, it will pay to check, first at the court house, and then at the farm. A one hundred foot tape or similar measuring device can be used to check the acreage on the farm. We will assume that we found the Smith farm to contain approximately 200 acres measuring to the middle of the road that serves as the farm boundary.

2. In making an inventory you will find one of the best tools is an aerial map. An aerial map of the farm serves as an additional check on acreage and as an aid in classifying the land. Where the boundaries are irregular, such as around permanent pasture. this map is a great time saver. It also shows at a glance the general layout of the farm and surrounding farms. And it is particularly useful in showing drainage ways and the drainage pattern of the surrounding territory, which in some cases are important factors in farm appraisal.

If you can't buy an aerial map, it is usually possible to make a tracing of the farm from the map in the ASC office. This tracing, showing boundaries, fences, streams, timber, farmstead location, and other physical features, will serve as the base map for the inventory of soils and other

important land factors.

A systematic trip around the farm with a soil auger or spade comes next. An appraiser usually takes along the tracing or a blank map of the farm on a clip board so he can make a permanent record of what he sees. The systematic trip around the farm is important because in this way every acre is checked. A good plan is to start at one corner and work along one side, taking 40 acre units as you go. In doing this you can zigzag to check the soil wherever there are indications of variation. A knoll, a pot hole, a gravel terrace, or an eroding gully are the types of variations that warrant special attention.

All this time spent on soil provides the necessary background for an intelligent estimate of crop and pasture yields. So, as you go around the Smith farm, keep asking this question, "How much will this soil produce?"

An important inventory point is the acreage of tillable land, since crop land is generally more valuable than permanent pasture. On the Smith farm, 140 acres are tillable, 51 acres are in permanent pasture, 5 in road and 4 in farmstead. At present only 135 acres are in crop but, after checking carefully, we decided that 5 acres of pasture could be broken and included with the crop land.

Buildings deserve the same systematic treatment given the soil. So we check each building, making notes on foundation, bracing, age, conditions, and capacity. This answers such questions as: How many bushels of corn and small grains can be stored? What facilities are there for dairy cows, hogs, and poultry? How good is the water supply? How much repair work will be required to put the buildings in good condition?

3. We are now ready to sit down to figure what the farm is capable of producing.

On the basis of our trip around the farm we estimate the acreages of the different soils. For the Smith farm it comes out like this: 30 acres of top-rated soil capable of producing 65 bushels of corn without fertilizer, 50 acres of medium grade soil that would average 50 bushels per acre under typical management, and so on. A complete run-down of our tillable land on the Smith farm would look like this:

Acres	Estimated corn yield
30	65 bu. per acre
50	50 bu. per acre
55	35 bu. per acre
5	20 bu. per acre
Total 140 acres	**46 bu. per acre (average yield)**

The small item of 5 acres rep-

resents a number of small patches of very sandy soil rated at only 20 bushels of corn per acre. In most years these areas burn out because they are so sandy. This estimating has been done in terms of corn because corn happens to be the principal crop on the Smith farm and throughout the Smith-farm territory. If we were in a wheat region, we would estimate the wheat producing yield of the different soils.

To get a realistic picture of what the farm will produce, we set up a typical crop and pasture plan, which for the Smith farm may look something like the chart below:

Crop	Acres	Yield	Production
Corn	70	46 bu.	3220 bu.
Oats	20	35 bu.	700 bu.
Soybeans	15	18 bu.	270 bu.
Clover hay	35	1½ tons	52 tons
Pasture	51	20 head of cattle or equal	

We need to stop here to make clear that you might be able to produce much more than the typical yields shown above. Instead of 46 bushels of corn per acre, you might figure on 55 or 60 by using plenty of fertilizer and lots of good management. But we are not valuing the farm in terms of top management. Instead we are basing our figures on what the average or typical operator will get in yields and consequently on what he can afford to pay for the farm. If we figured on a top operator, the value would probably be much higher than the going price for land.

In short, the top manager doesn't have to pay for a farm on the basis of his yields but on average yields. The extra margin in yields is the reward for top management ability.

4. We now turn to the dollar sign which means converting farm production into dollar figures. The simplest way to do this is to use what is called the "landlord" method. Under this system, you find what your net income would be if you were going to rent the farm to a tenant. This figure is actually the worth of the farm for one year—and it gives you the basis for a realistic appraisal of the productive value of the farm.

To get this figure, you first decide upon a fair and reasonable division of profit between tenant and landlord for the farm you are looking at. Landlord and tenant agreements differ from locality to locality, so you should make inquiries to find the most common and fair agree-

ment in the area in which your farm is located.

On the Smith farm, a good rental arrangement would work out like this: The landlord would get half of all the crops and would be paid $6.00 an acre for the pasture and $100 for building rent. He would pay all taxes, all maintenance repairs and insurance, and half of the crop production expenses. An estimate of his gross income would be as follows:

Crop	Production	Landlord Share	Price	Value
Corn	3220 bu.	1610 bu.	$ 1.00	$1,610
Oats	700 bu.	350 bu.	.60	210
Soybeans	270 bu.	135 bu.	1.90	255
Hay	52 tons	26 tons	14.00	365
Pasture	51 acres		6.00	306
Building Rent				100
Total Gross Income				**$2,846**

The most important, yet the most difficult, estimates are prices of farm products. I used $1.00 a bushel for corn and other prices in line but you may want to use a higher or possibly even a lower price level. Whatever price level you use sets the level of income value which you obtain in the end.

Our next objective is a realistic estimate of landlord expenses. As with the income, what we are after is the situation the typical owner is likely to have if he buys the farm. For example, on the Smith farm we estimate expenses in this fashion:

Item	Per Acre	Total
Taxes	$2.50	$ 500
Maintenance, repairs, insurance	3.50	700
Crop expense	1.00	200
Average total	$7.00	$1,400
Landlord Gross Income		**$2,846**
Landlord Expenses		**$1,400**
Landlord Net Income		**$1,450**

You will note that these figures have been rounded off. This is for ease of handling and to indicate that the figures are only estimates.

5. Income value of the farm is within reach when you have landlord net income. Net income to the landlord is the estimated worth of the farm for one year. What we want is the right to this income for all years in the

future. To get this we convert the annual income figure into a capital value—a process called capitalization.

Capitalization is simply a division of the annual income by an interest or capitalization rate. In choosing the rate it is common to base the figure on the farm mortgage interest rate—but placing it slightly higher because of the extra risk in owning a farm as compared to owning a mortgage.

We can capitalize the income on the Smith farm by dividing $1,450 by 5 per cent which gives us $29,000 ($145.00 per acre). The reasonableness of this $29,000 can be seen when you think of investing this amount in the farm as compared to investing the same amount in farm mortgages at 4 per cent. A 4 per cent return on $29,000 is $1,160 compared to the likely $1,450 return from the farm. However, as you know, farming has its ups and downs so that there is more risk in the farm than in a mortgage investment.

6. A market value estimate is our next step. First, we need a record of all the sales which have occurred recently in the territory with enough information about the quality of the land and buildings for each sale so we can make a good comparison of the farm sold with the farm being appraised. Make sure, however, that the sales are actual market transactions and not merely agreements between relatives. Also be certain what the actual price is, and what is included. For example, sometimes the growing crop is included, sometimes not.

In the Smith farm community we find five sales have occurred recently. A much better farm sold for $275 an acre. Another slightly better farm sold for $200; a farm about the same at $175; and two much poorer farms at $100 and $75 an acre. A careful study of the soils, layout and buildings on these five farms sold —as indicated on the soil survey map, aerial maps and observation — confirms the conclusion that the current market value of the Smith farm is somewhere between $150 and $175 an acre.

This conclusion may appear to have been arrived at too easily, but it must be remembered that in walking over the farm and in working out the detailed income figures we have obtained an excellent knowledge of the farm being appraised and of the general soil productivity situation in the community. This makes it easy to interpret and compare sales prices on farms within the community.

7. We come now to the last step—comparison of income and sales value, as in the Smith case, is usually above income value.

And there is a good reason for this to be so. Sale value includes intangibles such as farmstead attractiveness, special location factors, above average buildings, church, school, and other features not included in the hard core of income value.

For the Smith farm we had an income value estimate of $145 an acre and a sale value of $150 to $175. Applying our judgment to all the factors involved we arrive at a final market value of $160 an acre or a total of $32,000 for the farm. This is close to the $33,000 which the owner is asking.

You may wonder if all appraisals come out as close to the asking price as this. Certainly not. Not long ago in helping a purchaser buy a farm. I ran across a farm for which the seller wanted $125 an acre. He said he would consider cutting the price down to $115 an acre if the terms were acceptable. I suggested to the buyer that he have an appraisal made by a competent appraiser. When the appraisal report was submitted, the buyer was surprised to see a top market value recommendation of only $75 an acre. And a careful check of the appraisal indicated that $75 to $80 was a reasonable price to pay for the farm.

In the case of the Smith farm, we are ready now to answer your original question — is $33,000 a reasonable market price for the farm? In this case it is. If you want to buy the farm you should have little difficulty in reaching an agreement with the seller. And you can buy with assurance because both the income and sale value methods indicate the farm is worth about the price asked.

Lean Hogs Grow Fast, Cheap

Lean-type hogs grow as cheaply as fat-type porkers, according to G. R. Carlisle, Illinois livestock specialist.

Carlisle says figures from the Forrest Swine Test Station in 1954 showed little difference between fat and lean hogs so far as rate and costs of gain were concerned.

More recent research indicates that, if any advantage in cost of gains exists, it is in favor of lean hogs.

The Ohio Swine Evaluation Station fed two pigs from each of 108 litters separately to compare costs. The lean hogs, which would grade U. S. No. 1 on the market, required 334 pounds of grain to put on 100 pounds of gain. Fat hogs in the test, grading U. S. No. 2 and 3, needed 358 pounds of feed to put on 100 pounds of gain.

Illinois Farm News

Should You Wean Pigs at Three Weeks?

Here's a three-state roundup of pros and cons of early weaning by colleges and hog farmers . . .

Condensed from The Farmer

EARLY weaning—is it for you? "Yes," say some. "No practical advantage," say others. "The day is coming when baby pigs will be reared artificially in mass production," say still others.

Can you wean pigs at three weeks instead of the usual eight —at a profit?

"I can," answers an Iowa hog producer who weaned summer pigs at 2½ weeks, then made money on the earlier sale of sows. "I do," answers another, "by getting three pig crops a year."

On the other side, "early weaning did not lower our costs," reports a University of Minnesota swineman. "Both cost and growth performance left something to be desired in our trials," echoed a University of Wisconsin animal husbandman.

That's about the way the early weaning situation stacks up today.

Experiment station researchers agree with hog producers that pigs can be weaned at three weeks of age—that good producers can even trim the time to 2½ weeks. But there are many questions yet to be answered.

Wean at 2½ to 3 Weeks

Five Iowa hog producers who made money weaning pigs at 2½ to three weeks in trials last year sum up their experience this way: "The sows objected a little, but the pigs were eating prestarter in 12 hours. They liked it." One producer, by weaning summer pigs at 2½ weeks, was able to get sows on an earlier market. His pigs went to slaughter averaging 212 pounds at six months of age.

Another weaned pigs at 2½ weeks, then rebred sows about three weeks after weaning (six weeks after farrowing). Now producing three pig crops a year, he had 31 litters last year, weaned them all at 2½ weeks. He has 45 sows on the same program this year. Another advantage he points out—by using portable farrowing stalls, and converting his house to young pigs, he can get by on less space than is needed

Reprinted by permission from The Farmer, St. Paul, Minnesota

for sows and pigs together.

The University of Minnesota, on the other hand, couldn't cut costs by early weaning on the 500 pigs they experimented with last year. Pigs weaned at eight weeks made .11 of a pound greater daily gain than pigs weaned at three weeks. And they put the extra weight on for 80 cents less per hundred pounds of feed consumed.

Says Early Weaning Practical

Despite this, Dr. L. E. Hanson who conducted the Minnesota trials, says that "generally speaking, weaning pigs at three weeks is practical when good management practices are followed and when reasonably good facilities are available."

A 20 % protein formula produced the best growth in early weaned pigs at Minnesota's University Farm. Aureomycin or procaine penicillin at 40 grams per ton, and arsanilic acid at 120 grams per ton of feed helped increase weight. Addition of 10% sugar to feed helped get pigs to eat more, but adding such flavors as molasses did not.

Pigs weaned at three weeks got along best when they were fed in small groups—about 10 or 12 to a pen. Dr. Hanson believes pigs need five to six square feet each until they are eight weeks old. Pens should be draft free and cold concrete floors should be covered with clean straw or ground corn cobs. Pens should be cleaned daily. Small self-feeders and waterers should be placed where pigs can find them easily.

If scours show up Dr. Hanson found it best to make use of a water medication of soluble antibiotic or arsonic acid. He reasoned that sick pigs wouldn't eat, so couldn't get medication that way, but would still drink water.

Colleges' Experience Jibes

Wisconsin tests with three-week weaning produced about the same results as did those in Minnesota. Using a commercial milk substitute and pig starter, R. H. Grummer was able to get pigs from sow to the dry feeds satisfactorily, but growth rate was little more than mediocre and cost of gain was too high. A later trial with a lower cost milk replacer lowered cost of gain to about 17 cents per pound of gain, and increased average daily gains to a little over a half-pound per day.

If you plan to try early-weaning, here are the guide-posts to success generally agreed on by swine men:

- *Don't wean before three weeks* Pigs can be weaned earlier, but it takes a lot of know-how, and there is little advantage.
- *Provide comfortable, draft-free quarters.* The University of

Minnesota kept their barn at 65° F. and gave each pen of five or six pigs a 250-watt heat lamp.

● *Limit the number of pigs in a pen.* Ten or 12 pigs to an 8 by 8-foot pen is about right, especially the first week when they're learning to eat.

● *Provide ample space.* Five square feet of floor space is needed per pig for the first five weeks after weaning. By the time they are eight weeks old, more space is needed.

● *Keep pens clean.* Clean and disinfect pens before pigs are put in. Then keep them clean. Use bright, clean straw or ground corn cobs to insulate against cold concrete floors.

● *Treat scours promptly.* But consult your veterinarian when pigs become sick—you may have a serious disease that needs prompt diagnosis and treatment.

● *Provide pig-size equipment.* Buy or build special small-pig self-feeders and waterers. Shallow troughs and pans are not satisfactory. Pigs get into them, waste feed, and increase your sanitation problem.

● *Keep feed and water easily available.* In one experiment at University Farm moving the feeder two feet decreased the time it took pigs to learn to eat. Put a heat lamp over the feeder or waterer; that will encourage pigs to start eating. A creep of a small self-feeder in the farrowing stall before pigs are off the sow will start them eating before they are weaned, and thus lessen the shock of early weaning.

● *Pay attention to details.* Iowa State College swinemen say you need no better housing and equipment for early weaning than for raising pigs on sows, but careful attention to details the first week after weaning is important.

Meat-Type Hog is Described

A meat-type hog is not a bacon or lard animal but one which gives a high yield of lean cuts of pork when slaughtered, reports Dick Hollandbeck, Purdue extension swine specialist.

With the present spread in price between lean cuts and pork fat, the ratio of lean to fat is the most important item in determining the value of a market hog. In view of this it is important to emphasize heavy muscular development with a minimum of finish, Hollandbeck says.

Reducing the finish on a lard-type hog may improve its value from a market point of view but does not, in any sense, make it a meat-type hog.

Story of Donald Sanford, Jr.

The remarkable achievements of this young Future Farmer earned a National Award . . .

Condensed from The National Future Farmer

Bill Prince

"DONALD SANFORD, Jr., of Jasper, Alabama, a 1954 graduate of Walker County High School, was named winner of the Future Farmers of America national award for achievement in farm electrification."

Certainly all the FFA members who have entered the farm electrification competition, or other contests in the FFA program, from the chapter to the national level, know how much work it takes to win a national award.

Even before entering high school in 1949, Don was very interested in mechanics and was a ham radio fan. When he entered vo-ag work, his interest turned to farm and home electrification, because he found many opportunities to increase the scope of his farming program by putting electricity to work.

Don's early electrical projects included an infra-red pig brooder, lighting the barn, an electric water pump, and a small woodwork and farm mechanics shop, 8 x 10. Today, three years later, it would take several pages to list everything he has done around the farm with electricity. Don puts a conservative cash value of $1,625 on the electrical equipment he owns, but the actual value of this equipment working on the farm would be hard to measure in dollars.

"I can shell a bushel of peas and prepare them for the freezer in 15 minutes, and it used to take me 6 hours to do the same job," Don says of his electric pea and lima bean sheller—which he constructed himself.

The words "In God We Trust" were engraved on pennies for the benefit of those who use them as fuses.

Don has constructed an electric chicken picker, designed and built a heavy-duty stalk cutter from scrap material, built a 30-inch electric lawn mower, made an electric corn grinder and converted a hand corn sheller to electricity. During this past three years, he has wired or rewired the

Reprinted by permission from The National Future Farmer, Alexandria, Virginia

entire farm for more convenient and economical use of electricity.

"There are no installations on our farm that I did not plan and do, except four circuits in the house," says Don.

While you might think that Don is kept pretty busy making electricity work for him, he still has time for many activities. He was the FFA Chapter reporter, is a junior member of the Walker County Cattlemen Association, Communion Attendant at his Church, and Senior Crew Chief (Explorers) of the Boy Scouts of America.

While in school he was president of the student body, operations chairman of the Appreciation Club, member of the Beta Club, catcher of the baseball team, halfback on the football team, forward on the basketball team, and ran the 100-yard dash on the track team.

In 1953 he took first in the FFA Community Exhibit at the Northwest Alabama Fair, was on the team from his Chapter which took second place in the District FFA Beef Judging, and second in the State Contest as well. In 1954 he won the Chapter Public Speaking Contest, and, in his spare time he plays the piano.

To give you an idea of his FFA projects in 1954, they included a show calf, 2 cows, 2 steers for the home freezer, 2 sows and litters, 15 acres of corn, and 5 acres of cotton.

In 1952, Don won first in the Chapter Farm and Home Electrification Contest, and fourth in the State Contest. He won the Chapter Contest again in 1953, and this time took second in State competition. But 1954 was the banner year, for he made a clean sweep of the field, from the Chapter honor early in the year to the night of October 13, 1954, in Kansas City, when he stepped forward before 10,000 fellow FFA members to accept the National Award and the check for $250 that went with it.

A hay crusher acts like a giant wringer, lifting freshly cut hay from the swath and feeding it through steel rollers. These rollers are adjusted to crack the stems, exposing their inner surfaces to the drying air. Field drying time is reduced 30 to 60 per cent.

While this represents the end of the story that brought top honors to Don Sanford in Kansas, it is by no means the end of Don Sanford's story. He is going to college and plans to take a degree in electrical engineering. Then he plans to work with farm people to put more and more electricity to work on the farm.

Plants Tell Time to Graze and Mow

Purdue researcher gets a ton of bromegrass more per acre by proper management . . .

Condensed from Prairie Farmer

PURDUE University scientists have taken another step in pushing hay and pasture yields a little higher. Agronomist Merle Teel, working with Dr. G. O. Mott in pasture research, was able to get nearly a ton more bromegrass to the acre by regulating the time of grazing or mowing.

Here is what Teel found in one year's research. After cutting the first hay crop at the late joint or early boot stage he postponed the second and third harvests until new shoots appeared at the base of the plant.

The appearance of these new shoots marks the time when the food reserves in the plant are at a high level and the grass can stand removal of the tops with minimum damage.

He says that plant food reserves in many of the grasses in the cornbelt are carbohydrates in a form related to fruit sugars. These may be especially important from the standpoint of increasing the forage yield and maintaining grass stands.

There is evidence that if you remove the top growth when the sugar supplies are at a low level the regrowth will be slow and the yields poor because there are no raw materials to draw on for building new leaves. Such grass is commonly considered to be dormant, and it may be several weeks before the plants can get back to normalcy.

Teel recommends that a farmer should graze bromegrass-legume pastures under some system of rotational grazing. As soon as the growth is well started in the spring, turn in and graze it as completely and as uniformly as possible. Regardless of the grazing system used a certain amount of the grass will be refused due to urine feces spots. This is one of the big problems in pasture management.

As a general rule the pasture should be grazed off in as short a time as possible. The poorly grazed portion will tend to go to

Reprinted by permission from Prairie Farmer, Chicago, Illinois

seed during the rest period that follows.

It may turn out to be advisable to clip to prevent these seed heads from developing since they will eventually demand a great part of the stored sugars which could otherwise be used for the produciton of new leaf shoots and roots.

The rest period following grazing is the important factor in pasture management. The length of the rest period necessary for recovery will vary from year to year. It may be necessary to rest it longer on cold wet springs than on warm dry ones. Furthermore, the time required for recovery in June may be quite different than the time required in July or August.

The observations which Teel made last summer lead him to believe that the appearance of new shoots from the base of the bromegrass plants marks the time when it is safe to graze since it was at this stage that the sugars were either restored or were increasing rapidly. More research is needed to determine how reliable these shoots are as indicators.

The importance of grass in your pasture and hay mixture cannot be overemphasized. Teel points out that grass will help to prevent bloat.

Another big factor is that grass will reduce the incidence of heaving of legumes. It also provides a good supply of carbohydrates which are required for making good grass-legume silage.

Swift and Company's research committee has found Teel's work so promising that they have made a grant of $3,000 to continue it for three years. With the funds Teel hopes to find out more about what happens when high rates of nitrogen fertilizer are used; what effect irrigation has on sugars; and the effects of different management systems.

Atomic Research Ups Fertilizer 'Kick'

Tests with radioactive isotopes at Michigan State University have shown the way to improve liquid fertilizers.

Horticulturist F. C. Teubner said his experiments showed that other combinations of liquid fertilizers can be absorbed by plants quicker than those now in use. The radioactive material, used with the fertilizers, made it easy to measure absorption rates into plants.

Plants with a large leaf area are able to absorb large amounts of fertilizer quicker than if the plant food were applied to the soil. That's the big advantage in liquid fertilizer, now used widely by vegetable growers and home gardners. *Michigan Extension*

Are You Taking Advantage of New Tax Depreciation Schedules?

Know whether or not it is to your benefit to take advantage of "Fast" depreciation . . .

Condensed from
Farm Management

MANY farm managers welcomed the changes in depreciation rules made in the 1954 income tax law. "I'm living on depreciation this year," says one Farm Management reader who bought a lot of equipment last year and put it on one of the new schedules.

Whether or not he was joking, there's no doubt the new depreciation methods can offer tax advantages to many farmers. Still, a lot of growers have questions about these provisions, which became effective only for 1954 returns.

The chief question is: Which method will be best for me?

Several Methods

Within certain limits, you can use any method of figuring depreciation that is "consistent and reasonable." Methods specifically mentioned include straight-line, double - declining - balance and sum-of-the-years - digits. Some other methods may be used, but for most farmers these three give about as many alternatives as you'll want to consider.

In the past, farmers have usually used the straight-line method. This gives you the same amount of depreciation each year of the asset's useful life.

The two other methods give you faster annual depreciation during the first half of the useful life. By itself, this will not reduce taxes; it only postpones them. You get more tax-free deduction during the first half of the asset's useful life, but later on you will have less depreciation to deduct. Over the full life of the asset your total deduction will be the same for each method, and if your tax rate doesn't change much over the period, you pay about the same total taxes.

Limits to Use

Several limitations apply to the

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Union Stock Yards, Los Angeles, California

use of "fast" depreciation.

1) The asset must have a useful life of three years or more.

2) The asset must be newly bought or new in use. You cannot change to fast depreciation on any asset acquired before 1954. New capital improvements can, however, be put on a fast schedule.

3) With one exception, you cannot change from one method to another on any asset without permission of the commissioner of internal revenue. The exception is this: You may change from declining-balance to straight-line depreciation at any time without permission. This is permitted because you can never completely charge off an asset under the declining-balance method.

4) You can use different methods for different kinds of assets, but the method must be "consistent for any class of asset." Classes of assets might include machinery, trucks and cars, buildings, wells and pumps, and so on. If there is some doubt about what constitutes a "class," get advice from a tax expert.

The arithmetic of figuring depreciation by these methods is now generally familiar—see publications of the internal revenue service or your state college.

Differences Studied

While the general effect of the "fast" methods is the same, there are some important differences. Two USDA economists, Ralph R. Botts and Tyler F. Haygood, look specifically at three items: 1) cumulative depreciation under the two methods, 2) time for changing from double-declining-balance to straight-line, and 3) interest on investment in the asset during its useful life.

Here are their conclusions:

1) For an asset with a life of three to five years, the double-declining-balance method gives the greatest total depreciation during the first half of its useful life. For an asset with a life of six years or more the sum-of-the-years-digits method recovers a bigger share of the value during the first half of the useful life.

When three-fourths of the useful life is past, more total depreciation is charged off under the sum-of-the-digits method for any asset that is eligible for fast depreciation.

2) You will probably want to change from declining-balance when the annual depreciation under that method is about equal to what you will be able to charge off on straight-line. To find this for double-declining-balance, the USDA economists suggest a simple method.

Example Figures

For an asset with a useful life that is an even number of years, add 2 to the useful life, then divide by 2. For a useful life that is an odd number of years,

add 1, and then divide by 2. This gives you the last year for using declining-balance; change to straight-line the next year.

A simple example shows how this works.

You have an asset with a useful life of five years, and an initial value of $1,000. Here is the calculation: 5 plus 1 equals 6, and dividing by 2 gives 3. So you use the declining-balance method for three years, charging off 40% of the remaining value each year. This leaves a balance of $216, which can be divided into the last two years. Your depreciation in the third year will be $144, and $108 in each of the last two years.

If an asset had a useful life of 12 years, you would carry it on declining-balance for 7 years (12 plus 2, divided by 2) and divide the balance into the five remaining years.

Interest Cost

3) If you are doing a thorough job of accounting on your farm enterprise, you should include interest on your investment in depreciable assets as a cost. Which method of depreciation gives you the smallest total interest cost over the life of an asset?

The answer is about the same as for total depreciation, if you change from declining-balance to straight-line as suggested. At any rate of interest, the declin-

ABOUT "FAST" DEPRECIATION . . .

"Fast" depreciation postpones tax payments by giving you bigger depreciation deductions during the first half of the useful life of an asset. You may find this an advantage in:

1) Getting more capital gains, only 50% taxable.

2) Increasing operating capital by an interest-free "loan" from future income.

"Fast" depreciation does not by itself reduce taxes; it only postpones tax payments. Under some conditions, this may allow you to pay less tax, but it may also increase your tax payments.

This article discusses these points. It also gives:

1) Comparison of annual and accumulated depreciation on three different depreciation schedules.

2) Comparison of interest cost on assets under different depreciation schedules.

3) Method of finding when to change from double-declining-balance to straight-line depreciation.

ing-balance method gives the minimum interest charge for any asset with a life of three to five years. If useful life is six years or more, the sum-of-digits method results in least total interest against the asset. Either one gives less interest cost than the straight-line method.

Now for a final question: Does fast depreciation increase your net income?

That depends on several factors. Some of them won't be easy to predict; the two most important are tax rates and price levels.

Tax May Increase

If tax rates in general or your own in particular are going to be higher toward the end of an asset's useful life, fast depreciation may raise your total tax payments. You won't have as much depreciation to charge off later as you would under the straight-line method. Lower taxes in the future will have the opposite effect; you'll gain by postponing tax payments.

If price levels go up and other things remain equal, then your smaller depreciation deductions will be offset by your being able to pay in "cheaper" dollars. A lower price level would off-set the gain from postponing taxes.

The effect of capital gain is important to many people; fast depreciation tends to increase your capital gains liability. Right up to the last year, an asset will stand on your books at a lower value than it would on straight-

Annual and accumulated depreciation, per $100 or original wearing value, for an asset having 10 years of useful life.

	STRAIGHT--LINE		DECLINING-BALANCE*		SUM-OF-DIGITS	
YEAR	Annual	Accumulated	Annual	Accumul'td	Annual	Accumul'td
1	$10.00		$20.00		$18.18	
2	10.00	$ 20.00	16.00	$ 36.00	16.36	$ 34.54
3	10.00	30.00	12.80	48.80	14.55	49.09
4	10.00	40.00	10.24	59.04	12.73	61.82
5	10.00	50.00	8.18	67.22	10.91	72.73
6	10.00	60.00	6.55	73.77	9.09	81.82
7	10.00	70.00	6.55	80.32	7.27	89.09
8	10.00	80.00	6.55	86.87	5.45	94.54
9	10.00	90.00	6.55	93.42	3.64	98.18
10	10.00	100.00	6.58	100.00	1.82	100.00

NOTE: In practice, depreciation is based on estimates so it is not necessary to carry figures to the last decimal or make them total 100%.

* Declining-balance changed to straight-line after the sixth year.

line depreciation. Since capital gains are only 50% taxable, this money may be an important advantage.

Capital Gain

Here is how it works:

You have a piece of equipment valued at $10,000, with a useful life of 10 years. On straight-line depreciation, you recover $5,000 and have it on your books at $5,000 at the end of five years. With sum-of-digits method, at the end of five years, you have deducted $7,270 and the asset is on your accounts at only $2,730.

Now suppose you sell the asset for $5,000 at the end of five years. Under straight-line depreciation, you have no capital gain or loss. Under sum-of-digits, you have $2,270 in capital gains ($5,000 sale price less $2,730 value on your books). Only half of this is taxable, or $1,135. This is not the net gain, of course; the gain is only the tax on that amount.

If you held the asset the full 10 years, you would have no tax advantage either way, other things being equal. Fast depreciation would reduce your taxable income by $2,270 during the first five years, but in the last five years you would have only that amount to charge off. Under straight-line, you would be able to deduct $5,000.

There's still one more point to consider, the USDA men point out. In a sense, you can say that fast depreciation gives you an interest-free loan from future earnings. In any one year this "loan" is the difference between accumulated straight-line depreciation and the total depreciation under the fast method.

How you add up these variables will depend on your particular situation.

For example, you may cherish some hope that your income will rise from $5,000 to $15,000 over the life of a major asset. Unless general tax rates are lowered, this will put you in a higher tax bracket, and you may pay more total taxes over the period with fast depreciation than you might on straight-line depreciation. But very likely this won't be as important as the advantage of having a bigger part of the depreciation during the years when your income is low.

On the other hand, you may have good reason to "save" some depreciation for later years. In this case, you may prefer to use the declining-balance method (changing to straight-line according to the formula given above) because it gives you higher depreciation deductions in the later years than the sum-of-digits method. You might even like to use a declining-balance schedule with less than double the straight-line rate.

Many Calculations

Study of these alternatives offers opportunity for an almost-infinite amount of arithmetic. It is possible to carry such calculations to a point where they are a waste of time; remember the unpredictable variables of future income, tax rates, and price levels.

Here's a summary:

Fast depreciation gives you an opportunity to shift tax deductions from the last half of an asset's useful life to the first part. This may allow you to reduce your total tax payments over that period; it may also increase them.

Fast depreciation also offers opportunities to reduce the interest cost of assets, to obtain more capital gains, and to increase your operating capital. These opportunities exist whether or not there's a tax advantage, and they may even offset some disadvantage in the tax situation.

Infrared Lamps Will Save Pigs

Hog farmers can save the lives of thousands of pigs during the cold months through the installation of infrared lamps in the farrowing houses, advises Bruce McKenzie of Purdue University.

Each year about 3 million pigs are lost in the United States from chilling. But many farmers are saving an average of one and one-half more pigs per litter in the winter and spring by a simple installation of infrared lamps.

A 250-watt infrared lamp uses only six kilowatt hours of electricity per 24 hours of operation—at a cost usually less than 18 cents per day. "You can't afford to neglect chilling losses when it's such a simple and inexpensive operation to prevent them," McKenzie declared.

Heat should be available when the temperature in the pen goes below 45 degrees. Experimental research at Purdue has shown that weaker pigs chill in pen temperatures of 40 degrees and lower.

Since pigs chill easiest immediately after birth, an infrared lamp over the sow will give needed protection. The lamps can be moved to a protected corner within 24 hours after birth of the pigs.

One 250-watt lamp mounted 24 inches above the floor will prevent chilling when pen temperatures are as low as 15 degrees. Heat will usually be required only three days after farrowing to prevent chilling. However, the operation of the lamp in a protected corner may be advisable for longer periods in order to keep the pigs from being crushed by the sow. *Purdue University*

Stainless Steel Milk Tanks Need Care

Here are some helpful suggestions to help you keep your new bulk tank new . . .

Condensed from Western Dairy Journal

STAINLESS STEEL that has gone into your bulk milk tank will last indefinitely—with proper care. And, with proper care, your bacteria count will not climb beyond the limits of good, clean milk. Probably the single most important factor that is stressed by everyone is—"consistently clean your equipment and keep it clean."

While stainless steel is highly corrosion and stain-resistant, "it must be kept clean and free from milk deposits and excessive exposure to strong cleaning solvents," say the manufacturers.

The name "stainless steel" is one given to a family of steels that are high in chromium content. This added chromium gives a high degree of resistance to corrosion, and helps make that "easy-to-clean" polished surface.

But despite these excellent qualities of stainless steel, if it is under the wrong conditions, such as prolonged exposure to chlorides, it will corrode and become pitted. This results in a surface that is hard to clean and keep sanitary.

Here are some tips, that will make the job of keeping your farm milk tank in top condition an easy chore:

- Immediately after use, rinse the equipment thoroughly with tap water to get rid of all milk before it dries on the surface.

- Follow this by cleaning with hot water and a commercial dairy cleaner. Use the cleaner just as the manufacturer suggests. Be sure and brush the cleaning solution over all the surface.

- Get after those solid deposits or milk stones just as soon as you spot them. For this, use a stainless steel sponge, or a commercial milk stone remover. And use it just like the manufacturer recommends.

- After cleaning the equipment, rinse it thoroughly with hot water, and then let it dry. Some manufacturers and milk sanitarians recommend that stainless

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Union Stock Yards, Los Angeles, California

steel be sanitized with a chlorine solution after washing. If you do this, be sure to rinse the equipment again to remove the chlorine solution. If you let the chlorine stay in contact with the stainless steel for any extended time, the surface will become pitted and corroded.

● Some manufacturers and milk sanitarians recommend that stainless steel be sanitized just before you use it as a means of avoiding any tendency to corrode. It has been found that chemical sterilization of dairy equipment is the most practical and most widely practiced. Use of chlorine solutions before adding milk to the tank has been satisfactory, and is reported to be safe when proper care is taken. Be sure and check your procedure here so no off-flavors are given the milk.

You'll find that by following these manufacturers' recommendations your stainless steel farm tank should stay clean and sanitary indefinitely. However, where you have unusual water conditions, such as high iron, sulfur or salt content, special dairy cleaners may have to be used.

If you have any difficulty in keeping your stainless steel equipment clean, get in touch with your dairy sanitation or chemical manufacturer, they'll be happy to help with your problem.

Rule to Estimate Machinery Work

A rule of thumb makes it easy to estimate how much ground farm implements cover. To get the acreage covered in a 10-hour day working with a plow, disk, or other equipment, measure the width of the implement in feet. Multiply the width by the speed the equipment moves in miles per hour.

The answer allows for time for turning, going from one part of the field to another, and maintenance, reports R. O. Gilden, extension engineer at the University of Wyoming.

As an example of the figuring, take an implement with a working width of 10 feet operated at 3 miles per hour. To get the acreage covered in a 10-hour day, multiply 10 by 3. That gives an answer of 30 acres worked a day.

To figure out how fast an implement is going, walk along beside it for 20 seconds, walking at an equal speed. Count the number of normal steps you took during the 20 seconds and divide them by 10. This gives the approximate speed of the implement in miles per hour. *University of Wyoming*

WHO RULES THE ROOST?

Peace in the laying house is important to production . . .

Condensed from Monthly Poultry Suggestions

D. J. Bray

Chickens have to live with recognize only a limited number larger have ne to

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bird A dominates birds B, C, and D; bird B dominates birds C and D but avoids A; bird D avoids birds A, B, and C. Once this order is established, life in the henhouse should be fairly peaceable. Each pullet avoids her superiors, and her inferiors avoid her.

In larger flocks the order is less definite because the birds can feeders or waterers.

It might pay then to move in some range feeders and waterers for a few days. This familiar equipment should give the inferior birds more confidence—not to mention more room to eat and drink. When there isn't enough equipment, inferior birds may actually lose weight or even become culls. You can spot such

Reprinted from Monthly Poultry Suggestions, University of Illinois, Urbana, Ill.

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WHO RULES THE ROOST?

Peace in the laying house is important to production . . .

Condensed from Monthly Poultry Suggestions

D. J. Bray

Chickens have to live with each other just as human beings do, and they get along in about the same way. At one time they may "fly off the handle"; at another time they will sing and cluck contentedly together.

How important is it to you to have a serene atmosphere in your laying house? Well, happy hens lay more eggs. And more eggs bring in more dollars. So what can you do to make your hens—and yourself—happier?

In small flocks one of the first things the newly housed hens do is to set up a "peck order." Example: In peck order ABCD, bird A dominates birds B, C, and D; bird B dominates birds C and D but avoids A; bird D avoids birds A, B, and C. Once this order is established, life in the henhouse should be fairly peaceable. Each pullet avoids her superiors, and her inferiors avoid her.

In larger flocks the order is less definite because the birds can recognize only a limited number of their penmates. Birds in larger numbers may therefore have some "differences" from time to time.

It all sounds simple, doesn't it? But peace in the henhouse can easily be upset. You can make laying-house living proceed more smoothly by understanding a few simple rules of "chicken psychology."

When chickens are first housed, they fight a good deal. The reason is that they are establishing a peck order. The birds that are losing most of the battles may be afraid to line up at crowded feeders or waterers.

It might pay then to move in some range feeders and waterers for a few days. This familiar equipment should give the inferior birds more confidence—not to mention more room to eat and drink. When there isn't enough equipment, inferior birds may actually lose weight or even become culls. You can spot such

Reprinted from Monthly Poultry Suggestions, University of Illinois, Urbana, Ill.

birds on the roosts and nests or in unused corners of the house.

If you have more than one laying house, it will be best to house the early maturing birds in one and the later maturing birds in another. Pullets become more aggressive as they mature. You'll have fewer culls if you house each group separately. Comb development — not body size — indicates maturity.

When you add a few birds to your flock, you can expect trouble—especially among cockerels in a breeder flock, because the males are more aggressive than females. Several birds may attack the strangers until they are exhausted or, in extreme cases, even until they die. If you combine laying flocks in nearly equal numbers, you won't have this problem. But cockerels will fight when combined in any ratio.

Debeaking won't prevent peck orders from developing. In fact, there may be even more bickering when the flock is debeaked. Not all birds fight when settling their troubles. Some merely bluff and threaten. But, when debeaked, the dominant bird lacks the ability to put her inferior in her place, so there may be lots of "fussing."

Be that as it may, debeaking is still the practical answer to cannibalism and "pick-outs." It will reduce the number of injuries among birds. Once a bird sees blood, she forgets about peck order and joins the others in "working over" the victim.

Frightened birds are more restless and irritable than calm ones. Here are some simple precautions that should help to keep your birds quiet:

1. Keep dogs, cats, sparrows, and other birds out of the house.
2. Don't blow horns or operate noisy machinery near the laying house.
3. Knock on the door before entering the laying house.
4. Avoid quick movements in the laying house, especially in handling sacks or other bulky objects.
5. Some poultrymen put radios in their laying houses to accustom birds to "strange" noises.

In fright an inferior bird is likely to make a pass at one of her bosses and live to regret it later.

We hope these few tips may keep you from having to consult a chicken psychologist. Yes, peace in the laying house IS important to YOU.

The Soviet Drive for Wheat and Stock Feed

Report from an English farm magazine on farm conditions behind the iron curtain . .

Condensed from the Agricultural Review

SOVIET agriculture has been much in the news recently.

Russion delegations of agricultural experts have visited the United States, Canada and England. An American delegation has toured the Soviet Union, and late in September a British party began a fortnight visit.

These exchanges are the first for many years, and they suggest that the forty year old crisis in Soviet agriculture, if not completely solved, is at least easing.

Cost Enormous

Since the revolution in 1917, what was once a mainly agrarian country has been converted into the second industrial producer in the world. The cost has been enormous, and the farmers, peasants and agricultural workers have paid a disproportionately large share of it. In the early years after 1917 the attempt to impose a strict communist pattern in the land led to a disastrous fall in production, so that the policy of communisation had to be put into reverse in 1922. From 1929 onwards vigorous measures were taken to enforce collectivization, and production fell again.

During the last two years there has been a radical reorganization and vast new programs of planting are under way—clearly with some success, since the Soviet Union is once again exporting wheat, and the numbers of livestock kept are now for the first time greater than before the 1917 revolution.

The main feature of the agricultural reorganization was to reduce the number of collective farms from some 240,000 to 89,000. The average size of a collective farm is now about 11,000 acres, of which about 4,000 acres are arable land.

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More Initiative

Until May, 1955 the regional association of collective farms was empowered to direct what should be grown by each collective and in what quantities. Since then much more initiative has been left to the people on the spot, and decisions on crops to be grown in 1956 will be made by the managing committees of the individual collectives—a modification which is expected to lead to greater flexibility and efficiency.

Yet, at the same time, the central authorities have been unwilling to surrender all control. About 35,000 organizers were appointed with the recommendation that they should be made chairmen of the managing committees; it seems that they came from the towns, and were chosen for their administrative ability and Communist Party orthodoxy rather than on grounds of agricultural experience.

Enormous energy is being expended at present on two big projects. One is to extend the area under wheat into the virgin lands of Kazakhstan and Southern Siberia, the other a great increase in the acreage of maize (corn).

The wheat program is ambitious. Until recent years wheat could be grown only in the black earth region and in central European Russia, and in a belt across Siberia narrowing sharply from west to east. Except in the extreme west, it was practically all spring-sown.

Hard varieties have been bred which ripen in under 100 days, so that it is now possible to grow wheat as far north as Leningrad, and a new area has been developed around Yakutsk in eastern Siberia (latitude 62° N) where the frost-free period is usually just over three months.

Other varieties have been developed for specially dry conditions such as are met with in the southern steppes, and these are being extensively used for sowing in the new wheat lands.

It is claimed that in 1954 the area of new lands ploughed was 42½ million acres, of which 27 million acres were for wheat. Much of the land was dry steppe or semi-desert, though some had been cultivated at times in the past.

When the party of American farmers visited these areas in August, they commented on the danger that a dust bowl would develop. The Soviet authorities dismiss this fear, and are reported to have plans to rotate wheat with maize and other crops to preserve the humus content of the soil. But even they agree that it is too soon yet to say what the final result will be.

The other big project is the 'Corn-Hog' program, the idea of which was apparently taken from

the economy of Ohio. In 1954 the total area under maize was about 10 million acres, and it was proposed to increase this to 69 million acres by 1960; according to reports about 40 million acres were actually sown to maize this year.

Meat Shortage

Behind this grandiose scheme is the meat shortage which has bedeviled Soviet food plans ever since the revolution. With rising living standards, the demand for meat is increasing, and the authorities propose to satisfy it by an enormous increase in pig-breeding.

Stomach worms may be the cause if your cattle are not gaining as fast as you think they should, says a University of Illinois veterinarian.

Maize is said in Russia to produce more stock feed per acre than any other grain, and it is claimed that special techniques of sowing (it is planted 'on the square' with three or four plants in a group) will also enable it to be harvested with less labor.

Apart from the grain, the stalks and leaves will be used for silage. In areas where weather conditions are such that the grain does not ripen silage will also be made from the whole plant, including the ear.

The extra land for the maize has been found by reducing acreages of other crops, especially wheat, sugar beet and potatoes. The reduction in wheat acreages in some areas has been more then compensated by the opening up of the new wheat lands, though yields in the new areas are lower. Sugar beet production is now rather below needs, and the deficit is made up by imports from Poland.

Consumption of potatoes is expected to fall as more meat becomes available—at present potatoes occupy a disproportionately high place in the diet of Soviet citizens—and in any case a large part of the potato crop has been used for industrial alcohol, of which more is now being produced from timber.

Buying Abroad

Since the beginning of this year, the Soviet Union has bought some 100,000 tons of meat abroad for the second year running. A small proportion of this comes from neighboring countries, with which there are no payment difficulties; but the rest involves the outlay of scarce western currencies or of gold. This is one of the factors which gives urgency to the pig production program. It is estimated that by 1960 home production of meat will be sufficient for an increased demand,

and that about half of total consumption will be in the form of pig meat.

Parallel to the current meat shortage there is a shortage of fats. The emphasis in cattle breeding is on beef rather than dairy types, and supplies of milk are inadequate. Sunflower seed is grown very extensively, the oil being used as it is, sometimes made into margarine; but the quantity produced is too low to offset the shortage of butter.

The American visiting team reported that in some areas pigs were being raised to well over 20 score weight (400 lbs.) in order to provide extra supplies of lard. Part of the general deficit in fats is made up by imports of butter from the USA and elsewhere. But, even with imports, the shortage persists. The Soviet Union would apparently be willing to buy more butter than the American authorities are willing to sell.

Comparison Doubtful

When conditions and methods are so widely different, comparisons of costs of production are of doubtful value. All the same, the impression remains that Soviet costs are high.

Manpower shortage is a pressing problem, partly as a legacy from the days when official policy was to draw workers from the land into the industrial towns.

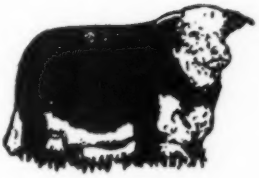
Nowadays, policy is in the reverse direction. Between 1950 and 1954 some nine million people left the land and the authorities became seriously alarmed. The new wheat lands are manned largely by teams of volunteer workers from Moscow and other big centers, usually without previous agricultural experience.

Elsewhere, efforts are now being made to induce workers, by improving amenities and raising the agrarian standard of living, to stay on the land. Visiting teams report, however, that the use of manpower is still wasteful and the Soviet party which visited Britain in August was impressed by the small amount of labor used in pigbreeding here.

Soviet use of machinery is, however, considerably more intensive since machinery pools (Machine-Tractor Stations, or MTS) serve groups of collectives. The same Soviet party was surprised to find for how many days a year tractors in Britain stand idle.

The general picture which emerges is that at present the Soviet Union is importing meat and fats, and exporting grain. If the maize program goes according to plan, meat imports should be cut to vanishing point in a few years and imports of fats reduced. One may also be sure that Soviet authorities will try to bring about this state of affairs.

Herd Bulls Need Adequate Living Quarters



More attention should be given to providing suitable quarters for the herd sire . . .

Condensed from American Hereford Journal

William Robertson, Bonnie Brae Farm

HERD bulls live in many varied types of quarters—some elegant, some good enough to provide health, comfort and more years of usefulness, others under adverse conditions, a constant threat to the health of the animal confined.

Feed in most cases is plentiful and of the right mixture, but the lack of a dry place in which to lay down, the ever presence of mud and filth, the lack of exercise and green pasture is bound to reduce the vigor and usefulness of a bull so confined.

I have been asked to relate some of my experiences with herd bulls that suffered from being housed in improper quarters, also to give my ideas on a practical barn or shed for the bull.

In relating my experience, which was one of the most pitiful, I will have to go back 35 years to Northern Illinois. Afterward, it turned out that one of the two bulls involved proved to be one of the great bulls of his time and the Hereford breed was indeed fortunate to have had such a sire.

In the end of a long, closed-in shed, no sunshine and very little light in two medium-sized box stalls, with solid partitions 5 feet high, these two bulls, representing a total of $31,700, were confined day and night. The bulls were fat. Grain in the feed boxes, while wasted, and hay provided most of the bedding. The caretaker, poor fellow, did not have any experience, he was following instructions the best he could.

The only chance these bulls had for exercise was when they were turned out in the lot to serve a cow, or driven 60 feet to the water tank at the end of the shed, supposedly twice a day. They drank in the same position

Reprinted by permission from American Hereford Journal, Kansas City, Missouri

as they ate their feed—down on their knees. The elder bull of the two, costing $19,000, was not serving anymore and when so reported to the owner, something had to be done.

The owner, by the way, lived in Chicago and visited the farm once a month. The help knew in advance when he would arrive so tidiness was in order for the day. He was not aware of the condition the bulls were in because he was under the impression the bulls were mean; therefore, had not seen them out doors for many months.

John Letham, veteran cattleman and highly respected authority on Hereford cattle was called. His instructions were carried out, and in less than 30 days I was ready for my first job among the Herefords. The feed boxes were cleaned out; the bulls went two days without grain, then the ration was crimped oats, bran, a handful of linseed cake damped with molasses. Prairie hay had replaced the clover.

The stalls were cleaned out and leveled with a new bed of hay. With the stocks completed and a new assistant on the job, we went to work on the foot trimming. It was nearing the end of August and much had to be done before winter set in. After the foot trimming, both were scrubbed with old crankcase oil, a very reliable remedy I have found in producing a healthy skin and a beautiful new coat of hair, besides killing all parasites and their eggs. The oil used must be free from kerosene or it will blister.

In a week the bulls were forced to take a little exercise daily. At the end of six weeks they covered a mile each day on pasture. They were returned to their stalls at night for safe keeping until new lots were provided by grading and new fences. The elder bull was now doing service. He put in a heavy winter's work, with few of the cows requiring a second service. Crimper barley had been added to the ration of oats, bran and oilmeal.

I figured each bull had lost 200 pounds in weight since released from prison; still they were near the ton mark, and carried it well. Spring came. The young bull went off to pasture with a number of cows and the older bull had the use of three acres of pasture at the entrance to the farm.

During the middle of May the following year, John Letham spent two days with us at the farm. Arriving at the farm, he headed for the bull. The owner and I went along. John was a man of few words. John commented very highly on the condition of the cattle and the progress that had been accomplished in such a short period. He

fumbled through his pockets and produced a piece of string. The bull, good natured and gentle, let me hold him by the horn while John took the measurements from the inside corner of the right eye to the left nostril, then from the corner of the right eye to the base of the left horn.

Stepping back a few steps he placed his hand on my shoulder and said, "Young man, you are looking at a perfect Hereford head: eyes slightly protruding, intelligent, correct dimensions, nostrils well apart, and a perfect set of flat, white horns."

My knowledge of Hereford cattle at that time was very, very limited, so these words coming from such an astute authority, have remained with me down through the years.

The Shallenberger show herd gained an enviable record at state and national shows. The bull with the perfect head, Repeater 131st, was famous throughout the Hereford world long before he passed on.

Show cattle, like some herd bulls, often suffer through lack of sufficient exercise, especially the older cattle and bulls. There are herdsmen today, same as in the years gone by, that had the idea that more flesh could be put on a beast by allowing it but little exercise. That is true in fattening steers. Their life is short compared with breeding cattle. Members of a show herd become sluggish at times, their appetite and action become deprived, more so in the older cattle.

If no sign of sickness is evident and their feet are in good shape, added exercise stepped up to normal or more speed, is the best tonic.

The master showman and breeder Willie Largent always has his cattle in top bloomy condition. Walking is not much of an effort to them.

I was often criticized because I allowed the famous Harrisdale show bulls of the late '30s, Pr. Domino Paladin and Pr. Domino Premier, so much exercise at home. I never worried. They were ready to eat when they came into their stalls each morning; they were ready for service when called upon. They carried enough flesh in the showring, and at the end of their show days, they carried on as herd bulls without sacrificing much weight. Proper exercise will develop an appetite; lack of such will ruin it.

The most suitable type of quarters for the herd bull is an open shed, facing south with a good sized lot not smaller than 80′ x 100′, on enough ground to furnish grazing part of the year. Here the bull has room to exercise, sunshine, outdoor temperature the year around, a dry place in which to lie down and is easy to keep sanitary. With the addi-

tion of water, he requires very little time and effort.

A shed 14′ x 30′ will provide ample stall room for two bulls and a 6′ manger, cross-ways in the center of the shed, also takes the place of a dividing partition. If a door is used in the north wall, through which to enter, place the 6′ x 6′ manger to the front of the shed. At the end of a storage space next to the north wall, it is very handy to have a 2′ gate, opening into the stall for the feeding of grain, and an outside passage from stall to stall. Feed boxes, large enough to hold minerals, also can be placed in the end corner.

V-type hay manger is all right. If the reach-in type is used, a little more storage space can be had by flooring over the manger. A steel drum is very handy to keep the grain in.

There will be times when you will want to shut the bull in. For this, a 5′ gate and partition across the front of the shed is very convenient. Two-by-six lumber or 1″ x 6″ native oak placed 7 inches apart will do very well.

The height of the walls will depend on the type of roof. The south side should be at least 8′ high to allow sunshine to enter, especially in the colder weather. Along the north, extending the length of the stalls only, up 2′ above the floor of the shed, an opening of about a foot will allow a breeze through the shed where it is needed most in hot weather. It should be closed in winter.

Milk Prices to be Steady During 1956

Dairy prices have held the gain they made earlier this year and farm economists at Michigan State University see no reason for a downturn. June 15 base milk prices on the Detroit market should be around $4.15 per hundredweight.

Supplies of milk will increase in 1956. Plenty of feed on hand now and a better price for milk in 1955 over 1954 may cause dairymen to add cows to their herds. Production per cow will be higher again next year, too. Total production will be a little more than in 1955.

If present trends continue, each person will use the equivalent of 700 pounds of milk or more next year. This consumption plus the population increase will help milk prices hold their own in spite of the expected production increase.

Michigan State University

International Visitors Discover Rural U.S.A.

Interesting story of our foreign "exchangees" who came to this country on the IFYE Program . . .

Condensed from National 4-H News

Barbara Funkhouser

KHALIL Ghattas wanted to come to America. He was offered a chance but Papa was afraid—afraid that his son would return to Lebanon, unhappy and discontent with his homeland's way.

But Khalil had his wish and lived for six months with U. S. farm families, several of whom operated chicken farms. He went home with more ideas than complaints, and today he and his brother have more than 3,000 chickens and a thriving egg business.

Now his father is very proud, as is the whole community. All are beginnnig to see the advantages of flying in healthy baby chicks from the U. S. at 85 cents each, vaccinating for disease, and using the new brooder. In time, the village will benefit both financially and culturally through this better understanding of America.

Khalil was an International Farm Youth Exchangee, one of 659 who have come from 44 countries since 1947 to gain a better understanding by living, working and playing with farm families throughout the country.

In clarification of terms, IFYE means the program and its participants. An "exchangee" is one who comes to the U. S. and a "delegate" is an American who goes to another country.

In 1954, 108 men and 54 women came as exchangees. According to a survey, they averaged 24 years of age, have three brothers and sisters, and came from larger land acreage homes than U. S. delegates.

39 per cent were Protestant, 22 per cent Catholic, 17 per cent Hindu, 16 per cent Moslem, four per cent Jewish, and two per cent Buddist.

Language-wise, 27 per cent came from English speaking countries and four per cent from other areas felt they could speak

Reprinted from 4-H Club News, Chicago, Illinois

English fluently upon arrival. Only five per cent reported no English ability whatsoever and the other 64 per cent were handicapped. What do these statistics mean? They mean problems! Problems of adjustment and problems also which lead to those small but significant human incidents that make IFYE just a little more meaningful.

In the regular program, exchangees must get to and from the shores of the U. S. by either paying their own expenses or receiving help from sponsoring organizations. Once here, they become the responsibility of the National 4-H Club Foundation and the Extension Service.

After a short orientation program either in California or Washington, D. C., they begin their experience of living with farm families in two states in different parts of the country.

"When one is 10,000 miles from home, he wonders how he will fit into the life of people about whom he knows nothing. How could he be accepted as a son in their homes when they know nothing about him? I can now say that at a time like this one begins to understand the other, the common good in all men stands out, and the differences dwindle rapidly," says Jal V. Bhiladwalla, an Indian in Indiana.

Last year, the exchangees spent nine weeks in each of two states with an average of seven families. More than half felt that three weeks per home was the most desirable length of visit and only three per cent felt it should be longer than five weeks.

During this time the exchangee is to be a member of the host family. In addition to participating in family activities, they are also doing a tremendous public relations job for IFYE and their home country. Each gives an average of 45 speeches to an audience of 3,000 people, averages four radio talks, and is the subject of 25 newspaper articles. The 1954 exchangees also chalked up a total of 87 TV programs.

Through family activities, they gain understanding and correct some of their false ideas about America. As Margaret Boyle of North Ireland says:

"I am surprised to find how similar Americans are to the folks at home. When I first came it was the differences that struck me. Now it is sometimes hard to imagine that I am not back in Ireland. I think that underneath, people the world over are just the same. When I came I believed, from seeing movies and tourists, that all Americans had heaps of money and never worked. I am amazed at how much time and energy American women put into homemak-

ing. I wish more of my people could come here and see for themselves."

However, through objective eyes, they see room for improvement. For instance, one exchangee admired the children for being sociable, confident, alert, and curious but could not understand why they are not taught to have more respect for others.

Although they are critical of the rush-rush pace and miss a close family life, they like the neighborly cooperation and the advantages offered young people through 4-H. Many are amazed at the dignity of labor wherein the landowner is proud of doing his own work and his wife has no servants. They appreciate the interest shown by Americans in learning about other countries but cannot understand why we know so little about geography and history, even of the U.S.

Yet when the time comes to leave, the story is nearly always the same. Victorino Joven of the Philippines says, "The day I'll leave the United States is fast approaching. I feel I am not yet ready to go. I have been taken by the American way of life and I shall never forget that I once spent six months in this country so great and beautiful. I shall always have a place in my heart for the American people."

Solar Energy May Become A Source of Heat and Power for Farm Use

Heat from the sun (solar energy) may some day supplement electricity and other power sources in performing a great variety of farm tasks, specialists say. A solar energy "collector," developed by the Kansas Experiment Station, working cooperatively with the U.S. Department of Agriculture, has been used to supplement electricity in heating a house. It has also been used successfully to help raise the temperature of water in an electric water heater.

Other farm projects for which solar energy may eventually be used include: milk cooling, dairy water heating, hothouse and poultry-house air conditioning, vegetable storage conditioning, and grain drying. Used in conjunction with electricity or other power sources, solar energy could materially reduce costs.

The collector developed in Kansas consists simply of a sheet of galvanized, corrugated metal roofing, painted black to increase its heat-absorbing capacity, and used as part of a roof or wall section. This device catches solar rays and transmits them to a layer of air underneath, sometimes raising its temperature 13 degrees.

Plotting Against Screwworms

Entomologists are hopeful that lessons learned in Curacao may make possible eradication in the Southeastern United States . . .

Condensed from Agricultural Research

CAN sterile flies repeat their Curacao performance and eliminate screwworms from our Southeast?

Entomologists who successfully eradicated screwworms from the 170-square-mile Dutch island in the Caribbean in 1954-55 are considering using the same method to control or eradicate screwworms in the southeastern United States. Male flies made sterile by radioactive cobalt waves were dropped from planes to mate with native females. But at least two more years of research are needed to learn if such a campaign would be practical in Florida, and to work out large-scale and cheaper methods.

Ideally, eradication should be undertaken after a very cold winter, when flies have been frozen out except in Florida's lower half. But since plans must be laid far in advance, workers must be prepared to produce enough flies to cover at least the average overwintering area, which extends roughly from Gainesville south.

Problems are essentially those of mass production. Since the method of eradication is new, entomologists have only their Curacao experience to guide them. To cover the Florida area, 50 million sterile flies must be distributed every week—250 to 300 times the weekly Curacao peak. Workers at the ARS entomology laboratory at Orlando, Fla., under direction of R. C. Bushland of Kerrville, Texas, want to learn to rear and sterilize flies on a pilot-plant scale first—say a million a week. Then they can multiply production by 50.

Research is needed to find a cheaper rearing medium, improve rearing methods to reduce the labor required, and streamline the various steps. Several "stink houses"—mass-rearing laboratories—will be needed. Rearing flies in small quantities is no problem; the maggots thrive on a body temperature, odoriferous blood-horsemeat mixture. But large-scale operations, involving

Reprinted from Agricultural Research, United States Department of Agriculture

20 tons of raw meat a week, require a great deal of planning and experimental work.

Giving each batch of flies a new cage cuts down the chances of disease spread. So an inexpensive, throw-away paperbag cage, with screen-wire ventilation peephole, has been designed to hold the screwworm flies for six days until they lay eggs.

Several gamma-ray sources will be needed in Florida to sterilize pupae; only one reactor was used for Curacao. Recruiting and training numerous experienced entomologists and strong-stomached scientific aides cannot be done overnight. Planes must also be adapted. The distributing tube and hopper with flip-flop lid invented for dropping flies over Curacao was manually operated, requiring two people per plane. If engineers can devise an automatic distributor, pilots can do the job alone. Probably 35 small planes will be needed.

How many flies per mile should be dropped? Over what swath width? How often must releases be made? These are still unknowns.

One promising lead now being pursued might benefit southwestern as well as southeastern stockmen. The screwworm fly is attracted primarily to wounded living flesh or warm-flooded animals. The attractants that pull the flies to a wounded animal are suspected to be bacteria or bacterial decomposition products. Some eight or nine strains of attractive bacteria have been isolated from wounds—one strain so magnetic that flies laid eggs on it. The attractant cannot be reproduced artificially; but perhaps the attractive elements can be isolated and synthesized. Such material might be used as bait for a natural control, particularly in the Southwestern States where eradication seems to be out of the question.

If screwworms should be eradicated in Florida, could the Southeast be kept free of the pests? Entomologists think it possible. Natural spread seems to be largely northward rather than eastward or westward; otherwise flies would spread from coast to coast. The southeastern infestation apparently stemmed from infested animals shipped in from the Southwest. State and Federal quarantines would probably need to be established along the Mississippi River to prohibit shipment of untreated livestock.

An attempt to eradicate screwworms in Florida would be costly. During some summers, however, flies from Florida attack livestock and wildlife as far north as New Jersey. They cause losses in the Southeast estimated at $10 million a year. Suppose an eradica-

tion program should cost $5 million. Even if the screwworm flies were not quite eliminated from this area, such a program would probably prevent enough livestock losses to pay for itself.

The Florida Cattlemen's Association and other livestock interests are vitally concerned with screwworms. The State of Florida has given USDA $25,000 for further research, and additional Federal funds have been allotted for the preliminary work that's now going forward.

Time Silage Feeding - Avoid Off-Flavor

Feeding silage after milking—a requirement for grade A milk production anywhere—doesn't have to upset the chore routine in the dairy barn.

George Werner, Wisconsin dairy specialist, says there are several practical ways to handle silage feeding, depending on whether it's corn or grass silage, and how much of it there is to feed.

Where cows get a heavy feed of all-grass silage and very little hay, it works well to feed half of the silage—enough to last until noon—right after milking in the morning, with the concentrate on top of the feed. Then give the cows all the day's hay at noon, and the rest of the silage after evening milking—enough to last until about midnight or a little later.

This way the cows will have the silage eaten at least five hours before each milking, and there won't be much chance of silage odors in the milk.

Where the cows get half grass silage and half corn silage, Werner says use the same time schedule, but feed corn silage in the morning, grass silage after milking in the evening.

Farmers having only corn silage can feed it all at one feeding in the morning, Werner says. But that won't work as well with grass silage, because it isn't as palatable as corn silage and cows need more time to eat it.

Feeding silage after evening milking has another advantage where cows push hay away in feed alleys. If the hay is all fed in the afternoon, the dairyman can be around to keep it pushed up to the cows.

Werner says by using one of these systems, the hay and silage feeding schedule can be worked out to permit heavy roughage feeding without any bad effect on milk quality. *Univ. of Wisconsin*

Have You Planned Your Estate Taxes?

An article of importance to all farmers and their families

Condensed from
Nebraska Farmer

FARMERS today, like everyone else, are normally well aware of the income tax and how it effects the ownership and operation of their farms.

A great many of them, however, do not have much information about Federal Estate Taxes. Did you know, for example, that if you died having a net taxable estate of $150,000 after deductions and expenses, your family or beneficiaries would normally pay the United States almost $18,000 in Federal estate taxes alone?

This does not include state inheritance or succession taxes, which would be in addition. The value of your property for Federal estate tax purposes is its market value at the time of death; and your property includes not only your land, machinery and equipment, livestock and crops, but also includes your life insurance, and also the full value of all jointly owned property, where your own funds have gone into its purchase.

Incidentally, the farmer who reports his income tax on the cash method, obtains a sometimes unexpected benefit for his family upon his death. Crops and livestock on hand at the date of death which have not yet been sold, take a new basis in the hands of the beneficiaries of the estate of their market value on the date of the farmer's death, and no one pays income tax on the value of livestock and crops on hand that have not yet been sold.

Of course, if the value goes up after the date of death, the beneficiaries would pay an income tax on the increase in value.

Each person's estate has an exemption of $60,000 for the Fed-

Reprinted by permission from Nebraska Farmer, Lincoln, Nebraska

eral estate tax. If the total value of the property owned by the deceased is less than $60,000, there is no Federal estate tax due. If the gross value of the estate is over $60,000, but the net value, after the deduction of mortgages, debts, and claims, is less than $60,000, a return is required, although no tax would be due.

Marital Deduction

There is written into the estate tax law, a provision called the marital deduction, which in effect gives a right to split the estate as between a husband and wife, similar to the income tax splitting provisions. Under this deduction, you are permitted to deduct from your estate, the value of the property left to your husband or wife, up to a maximum of one-half of the estate.

However, to take advantage of this marital deduction, the property must either be left outright to your wife, or so that she alone can dispose of it or use it. Certain insurance option payments, for example, do not qualify for the marital deduction, and unless certain special provisions are made in your will, a life estate to your wife will not qualify for a marital deduction, even though it has value.

You could, of course, leave all your property outright to your wife or husband and be certain of having the maximum marital deduction for your estate. The catch is that when your wife or husband dies, all the property will normally again be taxable in his or her estate. There will be no marital deduction for the survivor and as a result, the children would pay a much larger estate tax than they would have if it had been done some other way.

For example, a farmer having a total estate of $200,000 who left it all to his surviving spouse with a full marital deduction, would create a tax liability of only $4,800 at the time of his death,

'CON GAME

When the farmer asked for a $1,000 loan, the banker told him, "It's all right, George, you can have the money but on unsecured loans we have a rule that requires the note to be endorsed. Suppose you get your neighbor, Henry, to endorse your note."

That s o u n d e d okay to George, so he propositioned his neighbor, a respectable and solid farmer. "Aw shucks, George," the neighbor replied with a twinkle in his eye. "Let's keep this business among us farmers. You go tell that banker that if he'll endorse your note, I'll lend you the money myself."

but when his wife later died leaving the property to the children, assuming she still had it all, there would be another tax to pay at that time of $32,700, or a total Federal estate tax of $37,500, before the property got to the children. If the estate had been properly planned, there would be an estate tax of $4,800 upon his death, and another tax of $4,800 upon his wife's death, or a total tax of $9,600. This would mean a cash benefit to the children of approximately $28,000.

This dollars and cents difference represents in large part the explanation for the growing popularity of what are known as "trusts" in estate planning. By the use of a trust, matters can be planned so that your wife can have the use and benefit of all of your property during her lifetime, but upon her death, only the one-half which is left outright to her will be taxable in her estate.

The best defense against an accident is not to be there when it happens. Sounds like a joke, but it isn't. You can avoid "being there" when an accident happens—by seeing to it that no accidents happen where you are.

Generally this is done by providing enough property to qualify for the full marital deduction. The balance of the property is left in trust with the income to be payable to the wife during her lifetime, if necessary; and also whatever principal may be needed for her support and maintenance, even if it is all used.

Upon her death what is left of the trust goes to the children or other beneficiaries. By leaving a life estate in property to your wife, the same tax results can be obtained for the children or other beneficiaries, but, of course, your wife will be limited to the income only from that property during her life, and might not be able to sell or mortgage it, even if she needed to.

Individual Cases

Both methods have advantages and disadvantages which will vary from case to case, and your lawyer can plan with you to use them to the best advantage.

Many farmers, like a great many other people, have not gotten around to making a will. Even if you have not yet made a will; in effect, the state has made one for you. The law provides what will happen to your property and to whom it will go if you have not made a will of your own. These laws vary from state to state, and unless you know what the laws of your

own state provide, and also know that that is the way you want your property to go, it would certainly be advisable to consult your lawyer and have your will drawn.

It used to be that when you made a will you merely told your lawyer what you wanted to do with your property. Now, in view of the new and largely increased rates of the Federal Estate tax laws, your lawyer needs a great deal more information than that. He needs to know what property you own, and approximately what it is worth. He needs to know what insurance policies you have and how they are payable, and who the beneficiaries are. He needs to know what debts you have, whether your property is held in your own name or in joint tenancy with your wife, or other people, and in some cases he even needs to know what you paid for property when you bought it, and what it is presently worth, in case any gifts are contemplated as a means of reducing your taxable estate.

A city reporter asked pa on his 105th birthday: "What is your opinion of modern women?"

Pa: "Son, I quit thinking about women two years ago."

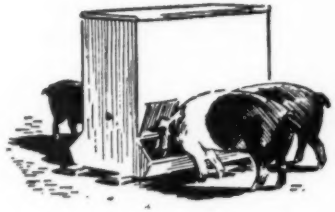
Gifts to charitable organizations are deductible for estate tax purposes, just as they are for income tax purposes, and so are all debts, mortgages, claims and expenses of administration of your estate. Gifts can also be used during your lifetime, but there are many considerations here which need to be weighed.

Federal estate tax rates are graduated the same as income tax rates, running from 3% on the amount between sixty and sixty-five thousand dollars, on up to 77%. For example, if the total estate is $110,000, but less than $120,000, the rate is 25% on that bracket of the estate, and of course, the Federal tax is on the total estate of the one who dies, without regard to how many individuals he may leave the property to.

A little time and effort in planning with your lawyer can pay big dividends to you in knowing that your family is properly taken care of, and can mean much to them in dollars and cents saved.

Stored grain fumigation is not, as a rule, effective when the temperature is below 60 degrees. As the temperature drops, the i n s e c t s breathe very little and thus do not take enough fumigant into the breathing system to destroy them, r e p o r t Purdue University entomologists.

Hog Farm Grosses $250,000



Hybrid pigs have turned part of Conner Prairie Farm into a seed-stock pig factory . . .

Condensed from Farm Quarterly

A NEW product on the agricultural market and a new technique for hog farmers were introduced by the Conner Prairie Farms, Noblesville, Indiana, in 1952. The new product: three lines of in-crossed boars from production tested families which have shown superior ability to convert carcasses. The new technique—a rotational breeding program which does two things: (1) permits each of the boars to pass on hybrid vigor when mated to the farmer's gilts and (2) gives the farmer a herd that is 98-7/16 per cent production tested stock after using six boars, even though he himself never weighed a pig or a pound of feed or looked at a carcass.

In 1954, the third year this project was in operation, Conner Prairie sold better than a quarter of a million dollars worth of boars. Last year (1955) proved to be even bigger.

The production of the three lines of in-cross boars is a combination of assembly line techniques and an industrial division of labor. Each of the three lines of boars is the result of crossing two unrelated inbred lines. Conner Prairie breeds and rigorously tests the six inbred lines; they have turned over the job of combining these inbreds to produce the three lines of commercial boars to producer-farmers who, in industry, would be called subcontractors.

In the beginning, the farmers who bought the boars fell into two classes, the adventurous fellow who gives every new idea a whirl, and the man who had made a study of genetics and was looking for ways to achieve hybrid vigor in his hogs. Today's customers are mostly neighbors of these men who have had a chance to see the breeding program in operation.

The man behind this revolutionary farming idea is Conner

Reprinted by permission from Farm Quarterly, Cincinnati, Ohio

Prairie's German-born manager, Tillman Bubenzer.

The hog project is one of three seed stock enterprises—beef, hogs, and dairy cattle—being run on Conner Prairie Farms which is owned by Eli Lilly.

Every day, Bubenzer sits in his office over the farm garage, planning the work for this departmentalized farm and making decisions.

Having been born in Imperial Germany and worked under conditions of rigid class distinction, it is not surprising to find Bubenzer intensely interested in preserving democracy here. The importance of individual liberty and the economy which makes this possible is a theme he manages to get into almost every discussion. When he talks of this new breeding boar project he says, "We feel that the farmer-owned farm which is so important to our way of life is being threatened because the livestock are inefficient converters of feed into meat. We feel challenged to produce an efficient, meat-type hog that will help the farmer increase the number of pigs he markets and reduce the feed it takes to bring them to market weight."

Inbred x Inbred Equals Hybrid

An important milestone in the search for efficient breeding stock came in 1946 when Connor Prairie bought its first inbred line, the Minnesota No. 1, which had just been created by Dr. L. M. Winters, of the University of Minnesota, by crossing the Danish Landrace with the Tamworth. A year later, the farm acquired foundation stock of the Minnesota No. 2, an inbred line of Yorkshire and Poland China. At first these two breeds were raised and sold as individual, pedigreed stock.

As more inbred lines became available, the idea for the present program began to take shape. Dr. Winters, who had created two of these lines, was retained by Conner Prairie as a consultant and worked out the genetic problems while Bubenzer and his hard working associates concentrated on the production problems.

You can harvest lumber from your farm woodland every year and still keep the same amount of timber while improving the stand if you cut out the annual growth as estimated by a farm forester.

They decided to create three commercial hybrid lines designed to be used in rotation. For their C Line they crossed their Minnesota No. 1 with the Montana No. 1, which gave them a hybrid pig with 51½ per cent Landrace blood, 22½ per cent Hampshire, and 26 per cent Tamworth. The E Line was made by crossing

San Pierre with Maryland No. 1 to produce a pig that is 44 per cent Berkshire, 31 per cent Landrace, and 25 per cent Chester White. For the F Line they crossed their Minnesota No. 2 with the Beltsville No. 2, which gives them a spotted pig with 49 per cent Yorkshire, 30 per cent Poland China, 16 per cent Duroc, 2½ per cent Landrace, and 2½ per cent Hampshire blood. As with all hybrids, each generation of these commercial lines must be made by crossing the original parent inbred lines — a C Line, for example, crossed to a C Line does not produce another C Line any more than a farmer's self-pollinated hybrid corn produces hybrid seed. This means that all six of the inbred breeds must be kept at the job of producing the breeding stock that goes into the crosses.

Faced with the job of producing the six inbred lines, which are their raw material, and combining them to form three commercial lines, Conner Prairie adopted the industrial system of sub-contracting part of the job to other farmers.

The 30 farmer-producers receive their breeding stock from Conner Prairie—boars of one of the two lines that make up a commercial line, gilts from the other—and combine them. Rigorous standards are imposed from birth to maturity. The boars and some of the gilts that survive the intensive culling are finally purchased by Conner Prairie and returned to the home farm for final selection and shipment to the customer. In this operation there are no "manufacturer's seconds"; all of the animals that are culled because they fail to meet the standards are fattened and sold for slaughter.

Testing the Inbreds

To keep up the production of the inbred lines at Conner Prairie, 35 sows are brought into the central farrowing house and put in the farrowing crates every six weeks. On the front of each pen is a record card to hold the information that is accumulated on each litter born. With farrowing, the first entry is made, the ease or difficulty of farrowing. Following this, Maurice Miller, the gentle, unhurried man in charge of the farrowing barn, enters the ear notches, sex, number and location of teat spots(Conner Prairie believes that the even spacing of teats is almost as important as the number), and the birth weight. At this point the first culling takes place. Any sow or gilt that fails to farrow eight live pigs is eliminated and the litter discarded.

For about 21 days the sow and pigs are held in the farrowing pen. Twice a day the sows are taken out for feed, exercise and sunlight, and to relieve themselves

on the concrete slab where their droppings can be more easily cleaned. The rest of the time they remain with their pigs in the barn, half of which is air conditioned with a heat exchange unit (as an experiment), the other half being ventilated by fan.

The anemia problem has been solved by giving each pig a squirt of a preparation called Swi-Ron at three days, a week, and again at two weeks. This mineral and vitamin material has the consistency of peanut butter and it takes a pig an hour or so of licking to get it off the roof of his mouth and down his gullet.

After three weeks the sows are taken from the farrowing pens and put out in the breeding lots. The pigs remain in the pens for another week, or until each of them has cleared up five pounds of the Iowa 75 prestarter which was formulated by Damon Catron of Iowa State College.

At four weeks 24 of the 35 litters are moved to a wing of the farrowing barn set aside for growing the young stock to the normal eight-week weaning age. In making this shift, at least 11 litters must be eliminated. Some of these may have been dropped because of small litter size; the others are culled on the basis of birth weight, rate of growth, number and location of teat spots (they must have at least 12), any defects such as rupture or ridgeling, and such conformation points as body length and firm underpinnings.

A significant fact in this culling procedure is that entire litters are eliminated rather than individual pigs. Throughout the entire testing and culling program at Conner Prairie, the emphasis is on producing entire lines with high averages in litter production, feed conversion, and the other important factors, rather than either outstanding individuals or even families.

As soon as the pigs are moved to the growing wing, the farrowing sections of the barn are cleaned and washed down with hot lye water under 300 pounds pressure.

In the growing wing, the pigs are housed by litters in pens equipped with heat lamps and automatic poultry watering cups. Their feed is gradually changed from prestarter to a regular starter mixture. At six weeks they are given shots of serum and modified virus for cholera, and at eight weeks they are ready for the feed conversion tests.

Before going on test the pigs are weighed again and the average weight for the litter figured. At this point, the boar pig which comes closest to the average weight for the entire litter is castrated and all other boar pigs which are lighter than he is are also cut. This drastic culling re-

duces the boars by half, but it is not the only culling that takes place at this time. Any litter which has less than eight pigs raised to eight weeks is also eliminated as are many litters which have done poorly during the growing period.

The litters that survive this third elimination are moved out to the concrete feeding slab for the feed conversion tests. "We feel that the only honest feed conversion figures must come after the early, fast, cheap gains are made," Bubenzer said. "We also feel that the feed conversion of the entire litter is the only reliable basis for judgments. We know that there is greater variation between pigs of a single litter than between litters—so what does a feed conversion test on the best pig in a litter prove? If we thought it proved anything, we'd save ourselves a lot of money by testing one instead of the whole litter."

While on feed test, each litter is penned into its own section of slab. Feed for the entire litter is weighed into the hopper twice a week and the pens cleaned at the same time. If a pig dies during the test, all feed consumed up to this point is noted and the rest of the litter goes on with the test. At the end of 98 days, the pigs are weighed and the total feed consumed is figured. By dividing the pig weight into the feed weight, they are able to find the amount of feed it has taken to make 100 pounds of pork.

To date the best feed conversion record was 247 pounds of feed for each 100 pounds of gain. But these men do not publicize the outstanding; they are interested in averages. The average feed conversion for the entire six breeds for the past three years—winter and summer, rain and shine—was 320 pounds of feed for each 100 pounds of gain. "That one figure is a concrete example of the effects of our selection program," Don Fisher said. "In seven years of testing and selecting, we have been able to reduce by 100 pounds of feed the amount it takes to make 100 pounds of gain. That is one of the important genetic characteristics we are selling to the farmer."

At the end of the feeding tests, one representative barrow from each litter is sent to the slaughter house for a carcass test. After slaughter, the head is split and the nasal passages examined for any signs of rhinitis (this disease hasn't shown up so far), the body length is measured from first rib to aitch bone, and backfat thickness is measured. This last measurement is correlated with live measurements taken with the electronic needle designed by Dr. F. N. Andrews and Dr. R. M.

Whaley of Purdue University for measuring backfat on the live animal. As skill in the use of this needle is acquired (and they have found that it does take some practice to get accurate readings), they plan to apply this backfat test to the live animals as well as the carcasses.

With all of the tests completed, Fisher is ready to make the final selections for the breeding herds. Small litters were eliminated at birth, litters that didn't have the vitality to raise eight pigs to weaning weight were also eleminated along the line, roughly half of the boars were castrated at weaning, and now he knows how the litter did as feed converters and what kind of carcasses they produce. First he culls out all individuals who didn't weigh at least 160 pounds at 154 days of age. Then he throws out any pig that has developed any physical defect. The feed conversion figures and the other records are then used against the pigs. Minnesota 1, which uses more feed to make pork (an average of 345 pounds per 100 pounds of pork for the past 3 years) is culled most heavily on this factor; San Pierre, which has the smallest litters (a three-year average of 9.89) has a heavier weight placed on this factor. In each case, the weight given any one point is designed to improve that particular line of hogs.

The animals which survive this final culling are used as replacements for the six home herds and as replacements and foundation stock for the farmer-producers.

Each farmer-producer is limited to the combining of two inbred breeds to produce one commercial line. All of his parent stock comes from Conner Prairie and the rigid standards of selection also come from there. Conner Prairie fieldmen visit the farm about once every two weeks to keep an eye on the work being done and to make selections of animals that will go to the customer. As at the home farm, litters of less than eight pigs are eliminated at farrowing. The pigs are weighed at birth, at weaning time, and at 154 days of age and any pig that fails to make 154 pounds at 154 days is automatically eliminated.

If you have health, all else is insignificant; if you don't have health, all else is insignificant.

"Small deeds done," says Peter Marshall, "are greater than great deeds planned."

At the time of selection, all animals have been given their cholera shots and had blood samples taken for brucellosis tests (all breeding stock at Conner Prairie and on the producer-

farmer farms is blood tested before each breeding). The culls remain on the farm for fattening for market; the boars and gilts selected for sale as breeding stock are shipped to Conner Prairie where they are unloaded in the area set aside for transient stock. As a sanitary measure, the transient area is separate from the breeding area on the farm. Different equipment and personnel are used and animals are never transferred from the transient group into the breeding herd.

Here, the animals are sprayed for mange and lice and are given a cadmium oxide worming mixture. Each animal is again individually checked for possible defects and selections are made from the group for the customer. Before shipment to the customer a performance certificate is made on the individual. This shows the vital information on him, such as farrowing date, number of pigs in his litter, number of teat spots, weight at 154 days, etc. The certificate also carries the three-year testing averages for every animal in the Conner Prairie breeding herd for both lines of his genetic make-up as well as the carcass data on the litter mate of his sire and dam. In the past, this testing data, which includes number of pigs born, number weaned, 56-day litter and individual weights, 154 day weight, and feed per 100 pound gain, was given for only the individual sire and dam of the boar or gilt being sold. In keeping with the concept that they are dealing with group genetics, however, Bubenzer now gives this information for the entire herd of each of the parent lines.

Shipping the stock from the producer-farmer and to the customer is done in one of three trucks which were designed according to scale models constructed by Don Fisher. The special bodies on the trucks confine each animal in an individual pen and permit loading or unloading any hog in any position in the truck without disturbing the others.

In general, the business arrangement with the farmer-producer is this: The producer-farmer is selected because he is considered a good hog man who has maintained a disease-free record with his own herd. Breeding stock is supplied him by Conner Prairie, but he must pay a deposit on each sow or gilt he gets from them. If the sow dies from any cause except cholera, the deposit is forfeited. Conner Prairie guarantees her against cholera and also guarantees that she will produce young. At the end of her useful life, Conner Prairie sends her to market and the deposit is either refunded or used for another sow.

The boar is Conner Prairie's

responsibility. No deposit is made on him by the farmer and Conner Prairie loses if he dies or is killed.

The producer-farmer agrees to sell breeding stock *only* to Conner Prairie and to sell all culls for slaughter. He also agrees to ear notch and keep the required records on every animal and to abide by the testing and culling which is part of the program.

Conner Prairie, on its part, agrees to buy those animals for commercial breeding stock which pass their inspection and for which there is a market. They also agree to pay a premium for these animals. In order to sharpen the eye of the producer-farmer for finding defects, they agree to pay a smaller premium for any animal found to be defective between the 154-day selection and the time of shipping, but to dock him the shipping charges for any such animal discovered after it reaches the farm for assignment to the customer.

All of the culls are the property of the farmer. This is an important item to many of them.

Two or three of the farmer-producers were purebred men before they changed over and enjoy the detail work and care that goes into raising a registered herd, but hate the job of selling the animals they produce. For them, this system is ideal, for Conner Prairie, with its industrial approach, has separated sales from production and has built up a special sales force to handle this end of the business.

As it works out, the contract and actual sale is usually made by the farmer salesman among his neighbors. The area man then services the sale. He explains to the farmer the breeding procedure which Conner Prairie recommends with the use of their boars. How do they convince a farmer that he should buy a boar that will cost him $195? "We don't talk about what it will cost him," Bubenzer said. "We talk about how much money the boar will make him. Here in Indiana the average feed conversion rate is 476 pounds of feed for each 100 pounds of pork produced. Suppose we say that your pigs are a little better than average and do it on 450 pounds. Our breeding stock has averaged 320 pounds over the past three years; a difference of 120 pounds of feed for each 100 pounds of gain. Let's say that our boar will only pass on half of this ability or even less—say a saving of 50 pounds of feed for each 100 pounds gain. You breed him to 15 sows twice a year; that should give you a conservative 200 pigs. You raise the pigs to 200 pounds which is a saving of 100 pounds of feed per pig. Two hundred pigs times 100 pounds of feed gives you a saving of

20,000 pounds or 10 tons. At $80 a ton that is a saving of $800. Now where can you make that much money in a year on a $195 investment and still have your boar left?

"But that is just your first boar. His offspring will be 50 per cent tested stock because of his blood. Your next boar crossed to the best gilts you raised from the first will give you another out-cross and pigs with 75 per cent tested blood; your third boar will give you 87½ per cent tested blood and so on until your sixth boar would give you pigs with 98-7/16 per cent tested blood. In other words, without doing a lick of testing yourself, you wind up with a herd that is almost 100 per cent blood that has been tested for large litters, vigor, feed conversion, carcass quality, fast growth, good meat type conformation, and no heritable weaknesses. And that is what we feel most farmers want today."

Bulk Feed Bins Cut Costs, Labor

More and more dairymen and cattle feeders are switching to bulk feed handling.

Bulk bins save money, cut labor costs, and reduce rodent damage in feed bags. To make an operation more efficient, these bins can be arranged so feed is dumped right into a mechanical feeder or feed cart.

As to capacity, it takes about 75 cubic feet of space for a ton of dairy feed, 70 cubic feet for a ton of poultry mash, and from 45 to 60 cubic feet for a ton of corn or small grains.

Ted Welchert, extension engineer at the University of Arizona, recommends that operators planning this type of feed handling seriously consider the hopper-bottom bin. Feed always moves to the bottom of this type of bin, making it easier to empty.

In building the bin, two sides are usually straight, while the opposite sides are sloped inward toward the middle of the bottom. Slope on these two sides must be 60 to 70 per cent so ground feeds containing molasses will move easily. Openings at the bottom need to be at least one foot square. This keeps ground feed from catching.

Flat-bottomed bins can be built for a slightly lower initial cost than the hopper-bottom type. But, the saving in labor by using the hopper-bottom more than offsets the additional construction cost.

Arizona Extension

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Sheep Science. Kammlade. 1947. 534 p. (Source 4) $6.00

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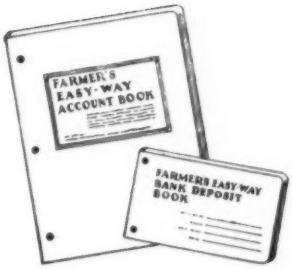

LET YOUR BANK KEEP YOUR BOOKS

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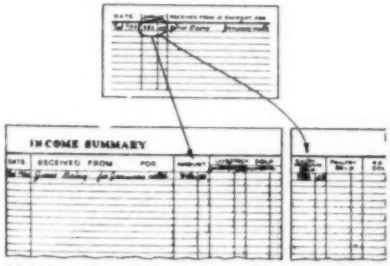
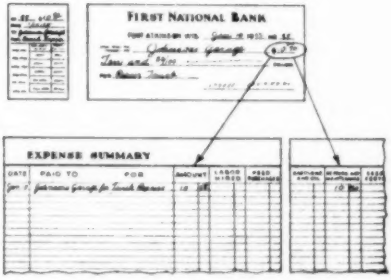


Above: It's fast and easy to transfer income figures from the Easy Way Bank Book to the Account Book. Note how the forms are planned to provide the information you must have for your tax returns.



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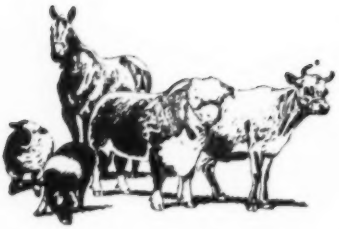
Fort Atkinson, Wisconsin



TOO MUCH OF EVERYTHING

DEPRESSES LIVESTOCK PRICES —

A completely new and unusual combination of events is depressing prices of hogs and beef cattle: (1) For the first time in history the supply of both beef and pork have rolled up to cyclical peaks in the same year. (2) Supplies of poultry, eggs, and milk have climbed to new record or near-record highs at the same time.

In order to move these record supplies, the economy has made two important price adjustments: (1) retail prices have been reduced to induce consumers to buy more meat than ever before; and (2) marketing margins have widened, giving processors and retailers a chance at larger profits and encouraging them to handle and promote the sale of the greater supplies. Both of these adjustments, of course, push down prices of livestock and penalize the farmer.

Beef Output Up 61 Per Cent

Beef production tends to run in waves or cycles, the peak outputs coming at intervals of 8 to 13 years. Peak years were 1905, 1918, 1926, 1934, and 1945. The latest upsurge has been greater than any previously recorded. Total production of beef and veal increased 61 per cent from 1951 to 1955!

26 Per Cent More Hogs

Pork output runs in shorter cycles of three to five years from peak to peak. Recent peak years were 1940, 1943, 1946, and 1951. We are now at the crest of the latest wave of hog production, which has increased 26 per cent in two years.

Production of eggs has been on a steep uptrend since 1952. The total supply of poultry is at an all-time high — about 27 pounds per person compared with only about 15 pounds before the war.

The supply of dairy products, too, shows more than pre-war 1935-39. Output of cheese is 42% more. Production and sales of ice cream are 83 per cent more than pre-war.

Some leveling-off in production plus continued strong consumer buying power during the next few years will surely bring substantial recoveries in prices of meat animals.

Based on an Illinois Farmer's Outlook Letter by L. H. Simerl, Department of Agricultural Economics.